Response to Council Member Questions on the Proposed General Plan Alternatives

April 16, 2012

Prepared by Development and Resource Management Department

Council Member Borgeas' questions emailed April 6th, Council Member Brand's questions emailed April 8th, and BIA questions emailed April 10th are listed and answered below.

Questions from Mr. Borgeas

1) Based on the water/acreage/deliverable analysis Patrick was using- how many units could be sustained in the northern part of SEGA by attaching to the City's existing water infrastructure (9,000 referenced yesterday) and how many units would be at the size desired by the BIA?

Water . . . In terms of helping to answer #1, I really would make the statement that I didn't get the opportunity to make Thursday night that I think will help get the conversation pointed in a more workable direction: "It is my opinion that Public Works and Public Utilities have or will have the capacity of water supply, treatment capacity, and other physical infrastructure (streets, pipelines, etc.) necessary to support the 2035 General Plan in any of the current alternatives. In each alternative, there is future investment in infrastructure that will be needed in order to support the alternative, and furthermore each alternative will ultimately require increased water conservation and water re-use in order for the water budget to be in balance. Each alternative will vary in the underlying cost to provide Public Works and Public Utilities infrastructure and services, but not in the ability to serve." (Patrick Wiemiller)

Number of Lots . . . Based upon 'complete neighborhood' design with a mix of densities as recommended for SEGA in the Administrative Draft Plan, staff assumes approximately 40-50% of the lots north of McKinley could develop at the 6,000 sq ft size (or 3,600-4,500 lots based on 9,000 total lots for this phase. Please also reference Tables 1 and 2 below of this Memo).

2) How many unit opportunities exist at the desired BIA size exist in West of 99 area North of 180?

And

3) How many units exist elsewhere in the City that could be developed within the desired size of the BIA?

At this stage in the General Plan Update, the alternative plan concepts were intended to illustrate and test the capacity of different urban form strategies that were formulated in consultation with the Citizens Advisory Committee, drawing on community input and the consultant's studies of peer cities. To estimate the buildout of each alternative and the number of lots that could be provided meeting the BIA's size criteria, the report presented to the Council reflects assumptions that were made about the average mix of product types, overall densities, and the probabilities of development by 2035, among other factors. Details such as lot size were also addressed in the context of overall density targets.

Table 1 shows the projected number of single family residential units (SFRs) that could be built under each alternative, compared to the maximum number of SFRs that could be built on the same amount of

land planned for Suburban Residential and Urban Residential uses. The numbers shown for the "maximums" are 15 percent to 20 percent higher than the baseline number for a housing mix. This calculation demonstrates that the potential to continue to build a "traditional home" on individually-owned lots is not eliminated under Alternative A or, in fact, any of the alternatives. Moreover, recognizing that over 10,000 lots already are available in "pipeline" projects, the traditional BIA housing product will continue to be built in response to market demands and housing needs.

Table 1: Single Family Residential Units by Location – Projected vs. Maximum Possible

	Baseline SFR Units				Maximum SFR Units			
	Westside*	***Elsewhere in City Limits***	***Elsewhere Outside of City***	***TOTAL***	***Westside****	***Elsewhere in City Limits***	***Elsewhere Outside of City***	***TOTAL***
A	8,377	9,895	9,162	27,434	9,669	12,008	11,491	33,168
B	8,316	8,034	13,224	29,574	9,606	9,797	15,788	35,192
C	9,550	10,579	17,577	37,706	10,142	12,595	20,628	43,365
D	9,722	10,651	12,438	32,811	11,029	12,750	15,134	38,913

**Westside includes land both in and outside of city limits.*

In the Alternatives Report, the assumption was that residential development would build out at a mix of densities, creating larger lot homes as well as homes on "standard" lots and smaller lots, attached single family housing (duplexes), townhomes, and apartments. For example, Suburban Residential was assumed to develop as 80 percent SFR and 20 percent townhome at an average net density of 5.6 units per acre – which could be a mix of houses on 6,000 square foot lots plus townhomes at 13 units / acre. But to maximize the number of conventional single family homes on 6,500 square foot lots:

- The Suburban Residential development type could accommodate up to 100% SFR; and
- The Urban Residential development type could have 6,000 square foot lots on *two-thirds of the land* in that designation, which would represent 40 percent of the total housing. The overall average of 10 units per acre could be met with apartments built at 30 units per acre.

Multi-family housing development at 30 units per acre or more is already proposed to be allowed the Downtown Neighborhoods plans and development project applications the City has received or discussed . This density is realistic for \ areas designated as Urban Residential as it does allow builders to maximize the number of houses on individual lots and minimize a mix of product types. City staff does expect to see these higher densities in the Major Activity Centers, as noted int eh Alternatives Report.

In Alternative A, in line with the Complete Neighborhoods concept, the idea would be to enable Fresno's developers to provide a mix of product types at varying densities. For example, under Alternative A, the idea is that a 160 acre site designated as Urban Residential would be expected to provide 1,600 residential units. That target could be met with a mix of houses on 7,500 square foot and 6,000 square foot lots [SFR], smaller houses on 4,000 square foot lots, attached homes, and houses with secondary units, townhouses, and small apartment buildings with four to ten units [multi-family]. The mix of housing types would be set by the developer in response to the market niches he wanted to serve.

For Alternative A as well as the other alternatives, the implementation mechanism would be a flexible zoning district that sets a minimum overall density and allows development broad leeway in meeting it, subject only to target land use allocations, expressed as minimums and maximums. Specific Plans and master plans also can be used for implementation, as bridges between the General Plan and site-specific zoning. Residential Neighborhood (RN) Districts have been used successful in cities throughout

the Central Valley and across the US, and can be executed by a larger master builder, or a suite of smaller builders who specialize in different products and buy land from a master developer.

Table 2 on the following page shows a basic structure for an RN District, which is being fleshed out in the concurrent Development Code Update. The numbers are preliminary and will be refined as development and design standards are fleshed out. Input from the development community will be solicited and discussed with the Citizens Committee.

Table 2: RN District – Potential Land Use Allocations		
	Allowable Gross Acreage (% of Total)	
	Minimum	**Maximum**
Residential		
- Single Family Detached, 1 to 7 units per gross acre	40%	70%
- Single Family Attached; Townhouse, 7 to 15 units per gross acre	5%	35%
- Multi-family, 10 to 25 units per gross acre	10%	20%
Civic Uses (schools, public safety facilities, community centers	2%	15%
Parks and Recreation	(3 acres / 1,000 residents)	

Following direction on a preferred plan concept, City staff and the Committee will refine General Plan development policies and standards to provide flexibility for individual development projects within a general framework for land use, open space, and community facilities. Site planning policies will set forth the basic parameters for more detailed master planning and development agreements. These development parameters would include: the general scale, character and mix of uses, as well as the overall density/intensity of development. The density/intensity ranges would support the traffic circulation and infrastructure investments that would be required. Also included would be guidance for development of parks and open space systems and integration of trails into new development.

These parameters will establish the basic character of new neighborhoods within Fresno. The Plan objectives would be to:

- Encourage compact development that is pedestrian in scale and sensitive to the environmental characteristics of the planning area.
- Allow sufficient density and intensity to enable new development to be self-sufficient, paying for all required infrastructure, community facilities, and open space.
- Ensure an interconnected local street and pedestrian circulation network that serves the needs of pedestrians, bicycles, and other non-motorized forms of transportation, and that functionally and physically integrates the various land use activities within the community and to surrounding neighborhoods.
- Provide for a range of housing types and prices within new neighborhoods to ensure that the needs of all economic segments of the community are met and the overall development can support the costs of required infrastructure and allow developers flexibility in meeting housing needs.
- Provide amenities for all residents, with open space, parks, activity centers, and recreational opportunities, including shared use of school lands.

These statements establish the ground rules for detailed master planning to be undertaken by the development community after the new General Plan is adopted. To ensure that Fresno attracts high quality residential development and that desired land use intensities are attained, a minimum overall level of development for the Suburban and Urban Residential development types is proposed as a planning concept. Sites for schools, parks, and other special places and community amenities also will be needed. The specific requirements for these elements still need to be established; this will be done in the Development Code update in consultation with our Technical Advisory Committee.

5) Can we get a mapping of these developable lots in these areas?

Staff is using the maps in the ***Alternatives Report*** which clearly identify the geographic areas where future Urban and Suburban Residential can be developed for each Alternative– See Pages 13,15,17 and 19. The tables and explanations above identify the likely amounts of units that can be developed as the 6,000 sq ft single family lots asked for by the BIA based upon 'complete neighborhood' designs with a mix of densities and building types as recommended in Alternative 'A'.

6) Can I get a rate breakdown of the conventional cost of developing a unit in a sprawl areas versus in-fill (I know very theoretical) and is there opportunity to incentivize infill with reduced fees?

Comparison of Direct Costs For Urban Infill Vs. Greenfield Suburban Development – Approximate.

In response to questions from City Council members, Staff requested the planning team prepare a comparison of the development cost of development in the Growth Areas with that in the Infill areas. The results of this brief study are general and not meant to be absolute. The reason for the lack of certainty is that without specific projects to evaluate, there are many unknowns.

These projections are meant to represent potential cost differentials between the two types of development and are not meant to be exact projections of true costs. Several residential developers that build both Greenfield and infill projects were informally consulted as was a real estate financial analyst. The best advice available without specific project information is general, but consistently was organized in the format shown below. The various assumptions that form the basis for this study are:

Development Types:

- Greenfield development is assumed to be single family detached homes on 6,000 sf lots.
- Infill development is assumed to be townhomes or small lot detached housing on approximately 3,000 to 4,000 sq. ft. lots.

Units/area:

- Conferring with the building department, 2,000- 2,200 square feet per single family detached residence is approximately the mid-range of those that are currently being submitted for permits.
- Likewise, staff is experiencing projects with townhomes that are averaging 1,600 square feet per unit being submitted for permits.

Construction cost:

- This is an element in the equation that can vary greatly. Construction cost is a function of level of quality, overall scope and phasing of development, type of developer (in-house construction or outside contractor) and the marketplace. The best information available reflects not absolute costs, but order of magnitude and the differential expected between the two types of development. This is based on the assumption that higher density costs more, but the true costs cannot be determined at this level of analysis.

Land cost per lot/door:

- Land cost is also just an assumption based on development yield and meant to be a reflection of the cost differential, not the true cost one would find in the marketplace today. That is a function of the development yield and marketplace.

Lot improvement cost:

- The assumed cost is higher for Greenfield development based on the assumption that there would be more required in the way of internal improvements such as secondary roads and grading. Infill development tends to have more infrastructure in place. Once again, these costs are meant to illustrate the anticipated difference in cost, not true costs of a finished lot in today's marketplace.

Indirect cost:

- Indirect cost is an assumption based on the direct construction cost including the lot improvement cost, but not land cost. Indirect cost includes architecture and engineering, legal and accounting, taxes and insurance, loan costs and interest during construction, developer fee, marketing and sales (exclusive of realtor fees). Permits and fees are not included. Insofar as this is simply a percentage obtained from a market analyst and based on the assumed direct cost, it also is just an assumption.

Development types	Units/area	Construction cost	Land cost per lot/door	Lot improvement cost	Indirect costs	Total
GREENFIELD	50 x 2,200 sf per detached single family dwelling	$80/sf	$75,000/unit	$40,000 per unit	25% project indirect costs*	$17,250,000
	110,000 sf	$8,800,000	$3,750,000	$2,000,000	$2,700,000	$345,000/unit
INFILL	50 x 1,600 sf per townhome or small lot detached home	$110/sf	$50,000/unit	$20,000 per unit	25% project indirect costs*	$14,750,000
	80,000 sf	$8,800,000	$2,500,000	$1,000,000	$2,450,000	$295,000/unit

7) Can there be a percentage of infill trigger, like the one that exists with SEGA Phase II, in broader terms within our City that will contain efforts to go beyond?

Yes

8) How will the option of phasing in SEGA into four or three parts effect our general plan alternative analysis?

It would not affect the alternatives analysis or the selection of a Preferred Plan. Staff will be recommending phases of SEGA and development priorities in other growth areas in the Implementation Element of the complete Draft General Plan to be considered by the Planning Commission in June 2012 and the City Council in July of 2012. The Implementation Element will also review general financing options and public facilities and services assessment district alternatives for corridor intensification, community revitalization, and new master planned neighborhood development.

Questions from Mr. Brand

1) Is 2010 or 2012 the base year as far as comparison to 2035? In other words, is there a 23 year or 25 year timeline?

The demographic comparison is from 2010, based on the US Census, so the population growth is 2010 to 2035, a 25 year comparison. But it is a plan developed in 2012. The differences should not be significant given the minimal development and population change in the 2010-2012 timeframe.

2) Is the 2010 population of the City of Fresno 495,000?

Yes, and the population of the Fresno Planning Area (Sphere of Influence) was 545,464, which is the base area we are working from for population to be accommodated by 2035. We are focusing more on understanding demand for land, resource, and service capacities needed to accommodate a general population and unit target in our analyses, plus impacts suggested that need mitigation, and not on hitting a particular population growth or unit count estimate precisely in 2035.

3) Is the projected population of the City of Fresno in 2035 estimated at 786,000? How does this figure compare with the forecast in the 2025 General Plan?

The population estimated for 2035 is for the Fresno Planning Area or Sphere of Influence (SOI), the same area as projections were made for the 2025 General Plan of 790,000 by 2025. The new 786,000 population estimate for 2035 is based on the Fresno SOI historically and continuing to represent approximately 60% of Fresno County population. We are using a new study titled **'San Joaquin Valley Demographic Forecasts 2010 to 2050'** (attached) that was commissioned and

recently approved on April 5, 2012 by the eight county COG Directors. The Fresno County total estimated population for 2035 in this rather detailed study is 1,300,000.

4) What is the projected annual growth rate and what is the projected family household size?

The average annual population growth rate from 2010 (545,464 in the SOI) to 2035 (786,000 in the SOI) would be 1.47% annual rate of population growth. This is versus the 1.75%-2.0% plus rate of growth estimated by the Department of Finance in 2007 when they last projected 2035 population for the Fresno area.

We assumed an average household size of 3.23 in new households in 2035. This continues the average annual rate of household size growth experienced by Fresno between 2000 and 2010, according to the US Census.

5) The total projected housing units in Alternative A is 75,900. The breakdown is 25,400 single family homes, 13,500 townhouses, 22,800 multifamily, 3,300 pipeline and 10.900 downtown. Please answer the following questions based on that data:

a) Are pipeline approved map vacant lots within the city limits?

Pipeline of residential units represent:

- 2,600 units proposed by the Assemis in the Westlake Development - which is not yet in the city limits;
- 600 units proposed by Lance-Kashian as part of the Fancher Creek Town Center – which is in the City Limits
- 115 units proposed by the Zinkin as part of the Fresno 40 Project - which is in the City Limits

b) What is the breakdown (i.e. single family, townhouse, or multifamily) for the projected 10,900 downtown residential units?

The unit count was previously estimated in draft Downtown planning documents at nearly 11,000 units and reduced to near 10,000 just after General Plan analysis of alternatives began.

The development potential for the combined DNCP and FCSP assumed 1,931 single-family detached units and 8,059 multi-family units for a total of 9,990 residential units, however our development potential did not get into any more detail than that, e.g., how many townhouses, courtyard housing, etc.

Juan Gomez-Novy – Downtown Consultant from M&P

c) Is the timeline to build out the projected residential units (i.e. 22,800 multifamily) over 23 or 25 years?

Technically it is 25 years – although we only have 23 years left – If approved by City Council, creating the land, infrastructure and service capacities, updated standards in the new Code, and procedures for permit steamlining for this number of units over a reasonable period of time close to or just beyond the planning period would be the goal.

6. Can you provide me the historical data for number of permits issued for single family units and multifamily units since 1980? I know there is data as I have seen it at different times over the past 30 years. This information is critical to confirming capacity limits on Alternative A and alignment of Projections.

See 10 year table below . . .

Building Permit Data – City of Fresno – For 10 years – 2002-2011

	Single Family Units	Multiple Family Units	Total
2002	1,331	234	1,565
2003	1,228	12	1,240
2004	1,669	521	2,190
2005	1,923	427	2,350
2006	2,521	216	2,737
2007	2,121	256	2,377
2008	1,731	522	2,253
2009	1,224	311	1,535
2010	818	137	955
2011	683	99	782
Total	15,249	2,735	17,984
Annual Average	1,525	274	1,798

The table above was generated from data extracted from our electronic project tracking system, Sungard Naviline, analyzed and vetted at the end of 2011 to show the number of building units constructed over the last 10 years. With some additional work by Monday April 16th, we can go back to the Sungard Naviline database for data to maybe 1997. The system was implemented during the 1990s. Our data extract can begin with the first year we are reasonably confident was tracked completely in the new system.

In order to create a report of housing constructed since 1980, we have to go to pre-electronic records. We have Monthly Building Reports and Annual Building Reports that go back to the 1970s in our Records section. This would take about 10 days to extract the housing units constructed for each year for the past 30 years. It's possible this has been done in some form before, but staff in the Building Permit area now do not know of a source for this previous work.

The Monthly Building Report reports housing starts. The permit data in the table above is a count of finaled permits and can therefore be understood to represent housing units completed during the reporting period. If we present data from the Monthly Building Report we need to explain this difference. Housing projects can start in one year and finish in another; they can also start and then not finish. For these reasons, the numbers are slightly different but similar to the number of finaled permits.

7. Are townhouses considered condo's and P.U.D.'s?

They can be - A **condominium** is usually defined as a housing structure that is a part of a bigger unit or building and the owner of the condo owns the interiors independently and the other services in the building jointly with other condo owners. A condominium will always have a homeowners association to maintain common space and will normally be developed in a P.U.D. In comparison, a **townhouse** is a style of housing where a row of houses share walls. Here the owner owns the whole unit as such. In townhome settings, the owner will typically have title to the land on which it sits. In most townhouse developments, units have direct access to the ground floor, and can be developed as part of a P.U.D. or not.

Under either scenario, there may be under a separate legal structure. Under existing regulations, both require a subdivision along with a Conditional Use Permit. As part of the 2035 General Plan and Zoning Ordinance updates, staff is exploring alternative tools to permit both uses.

8. Could you provide me with a comparative development fees matrix for Fresno, Clovis, Sanger, Madera, Kerman and Selma? I want to find out how competitive we are and what cost developers will have to pay to develop outside of Fresno. I do know that Sanger is currently waiving some development fees.

We can provide this information, but will need more time to survey jurisdictions and compile the desired comparison matrix. We believe this is important information to consider with the draft General Plan which is proposed to be heard by City Council in late July and could attempt to have this done by that time.

Questions from the Fresno-Madera Building Industry Association (BIA)

BIA is requesting that the City provide the following information with regard to Alternative A:

1. **How many 6,000 sq. ft. lots can be built.**

   See tables and explanations above in answer to same question by Mr. Borgeas.

2. **Provide a map depicting where the 6,000 sq. ft. lots can be built.**

   Staff is using the maps in the ***Alternatives Report*** which clearly identify the geographic areas where future Urban and Suburban Residential can be developed for each Alternative– Pages 13,15,17 and 19. The tables and explanations above identify the likely amounts of units that can be developed as the 6,000 sq ft single family lots asked for by the BIA based upon 'complete neighborhood' designs with a mix of densities and building types as recommended in Alternative 'A'.

3. **Of the 6,000 sq. ft. lots located in the SE, how many can be served with current water and sewer capacity.**

   I'm not sure exactly what is meant by "current water and sewer capacity", but I'll attempt to respond in general terms until a more specific question is asked. In some terms, it's impossible to identify "capacity" for a specific area to the exclusion of all other areas. As an example, the Regional Wastewater Treatment Facility has an available unused capacity of 12 million gallons per day. If there is no development or increase in use in any other part of the City, then there is enough wastewater capacity to serve about 27,000 6,000 sq. ft. lots in SE Fresno. As with any development of any size in any location of the City, there needs to be additional infrastructure built (pipelines, etc.) to serve any additional development. That same sort of analysis holds true for water capacity.

4. **BIA asked on April 11, 2012 at their regular monthly meeting with City Planning Staff – For a breakdown of how many vacant 6,000 sq ft lots are in each approved tract map that represent the total 12,000-14,000 vacant approved lots staff has reported to the public and City Council.**

   We are working to answer this - but it is a lot of work – there are about 88 maps to retrieve, review and calculate net average lot sizes for - in order to precisely answer the BIA question, plus analysis of final maps that have vacant lots and test in the field for accuracy.

Draft Responses to Council Member Brand's Additional Questions Posed by Him via Email on April 12th

Question Related to Comparative Cost of Farmland Conversion: At our meeting last week you talked about the economic impact of agriculture. Would you please explain what the cost per acre is to convert agricultural land into urban use. Of the five alternatives, plan A results in the least annexation of unincorporated land. The other plans will annex between 21,000 to 26,000 acres of land. Can you show a comparative cost basis for each alternative relative to the consumption of agricultural land?

Based upon the Fresno Farm Bureau and American Farmland Trust crop value per acre estimates below (emails from Ryan Jacobsen and Ed Thompson respectively) – staff has constructed the following table of farmland conversion costs for the Southwest (SW) SOI expansion proposed only in Alternatives 'C', 'D', and 'E':

	Alt. A	Alt. B	Alt. C	Alt. D	Alt E.
Acreage of Proposed SW – SOI Expansion –			5,440	3,360	6,240
Minus 240 Acres for Kearney Park			240	240	240
Minus 10% for houses, packing, infrastructure, roads, etc			520	312	600
Net Adjusted Converted Acres of Farmland			4,680	2,808	5,400
Farm Bureau Estimate of Crop Value per Acre (with Local Economy Multiplier Effect) Lost in Conversion – 2010 Dollars			$13,685	$13,685	$13,685
Total Estimated Annual Crop & Local Economy Value Loss for Total Acres Lost			$64,045,800	$38,427,480	$73,899,000
2050 Cumulative Loss (38 years)			$2.43 Billion	$1.46 Billion	$2.81 Billion

April 12th and April 13th Emails from Fresno Farm Bureau and American Farmland Trust:

Keith—

I agree with Ed's analysis below with a few minor changes:

For the Southwest area, I would mostly use grapes (raisin variety) and almonds as the most significant crops. There are a few dairies and open ground crops in this area, but it's predominately these two crops.

In the 2010 Fresno County Crop Report, raisin grapes averaged 10.47 green tons/acre or 2.62 raisins/acre in Fresno County. The "green" price last year was $265/ton and the raisin price was $1,700/ton. Using a 50/50 split for this area, the average price would be $3,615/acre.

Almonds averaged 1.23 tons/acre with a price of $3,419/ton equating to $4,205/acre.

Assuming a mix of 50/50 grapes and almonds in the SW area, it would be $3,910/acre.

The University of California uses a 3.5 multiplier effect for agriculture. For every one dollar of farm gate value, it turns over an additional $3.50 for the local economy, thus that $3,910 would mean $13,685/year to the local economy. Multiply whatever number of years to get the long-term effect. The likelihood is these crops would become more valuable over time.

When using on a large scale, I would subtract a conservative 5-8% of the land out for houses, packing house, infrastructure, roads, etc since not all land is in production.

Please let me know if you have any questions.
Thanks, rj

Ryan Jacobsen
CEO/Executive Director
Fresno County Farm Bureau
1274 W Hedges Ave
Fresno, CA 93728
Telephone: (559) 237-0263
Fax: (559) 237-3396
Email: ryanj@fcfb.org
Website: www.fcfb.org

-----Original Message-----
From: Edward Thompson [mailto:ethompson@farmland.org]
Sent: Thursday, April 12, 2012 3:17 PM
To: Keith Bergthold
Cc: Joe Distefano; Dan O'Connell
Subject: Re: 2035 General Plan Question

Keith - Not exactly sure what you're trying to measure. But on the assumption that it is the cost in terms of lost agricultural production, here are some statistics and calculations that might help. According to the 2010 Fresno County Agricultural Commissioner's crop report, the average annual farm gate value of the county's top three crops (grapes, almonds and tomatoes) is about $4,600 per acre. If you lost that annual production every year through 2050, the total loss would be around $175,000 (without discounting or adjusting for inflation). The multiplier used to translate farm gate value into total agricultural economic product is typically

around 3, so applying that would result in a loss of $525,000 per acre of farmland converted. Thus, if Alt. A would save 10 square miles -- let's say 6,000 acres -- compared with Alt. C , the amount of additional agricultural economic activity between now and 2050 would come to something in excess of $3 billion. I think the real point is why would anyone want to give up this much existing economic activity to accommodate X amount of additional economic growth unless it is absolutely necessary. As Alt. A demonstrates, it clearly is not.

Edward Thompson, Jr.
California Director
American Farmland Trust
Box 73856
Davis, CA 05617
530-231-5259 Office
202-309-1162 Mobile
www.farmland.org/california

Questions Related to Fiscal Impact Assessment

1. Define "optimal service standards"? Explain how they differ from current service standards.

City staff have stressed that the current service levels are sub-optimal and continue to have negative implications on the quality of public services and infrastructure with important implications on the quality of life of City residents (e.g., public safety, recreation, and transportation). As a result, the fiscal impact analysis also evaluates optimal service standards based on interviews with City staff from each of the four key departments. The determination of optimal service levels varied in each case as described below.

- ***Police:*** the optimal service standard is based on the 2.0 officers / 1,000 ratio articulated in "2025 Public Safety Needs Assessment" as "middle ground" between 2003 staffing levels (1.67 officers per 1,000 population based on the current data at the time) and the national average (2.3 officers per 1,000 population). For comparison, the current service standard in Fresno is 1.5 officers per 1,000 population.
- ***Fire:*** the Department indicates that between 9 and 12 firefighters per engine company is typical. While the existing service standard reflects the minimal end of the range, the optimal service scenario reflects 12 firefighters per engine company, a staffing increase of 33 percent above the current service standard. The optimal service scenario also reflects an additional infill fire station added to serve a combination of existing and future infill population growth.
- ***PARCS:*** The EPS analysis assumes park cost is a function of number of acres and average maintenance cost per acre. Park acreage varies by General Plan alternative and the analysis focuses on a per acre maintenance cost as a proxy for the level of service. Specifically, the optimal service standard maintenance cost assumption of $8,000 per acre is 33 percent above the current service cost estimate of $6,000 per acre.
- ***Public Works:*** similar to PARCS, public works maintenance is estimated to vary on a per unit basis as a proxy for the service level of key items. Specifically, these items include maintenance of parks, roads, landscaping, sidewalks, curbs and gutters, street lights, road signals, as well as street sweeping and tree trimming. The optimal service standard cost for these items, based on a combination of department staff input and EPS experience in other comparable jurisdictions,

yield an annual maintenance cost of $15.3 million. For comparison, the current service level cost is estimated at $9.2 million. It is worth stating that in both cases, the majority of the Public Works maintenance cost is currently covered by non-General Fund sources.

2. Please explain and detail the difference between City and County revenue sharing agreements on annexed land and land located within our boundaries. Is there a significant difference in our share of revenues?

The City and County of Fresno currently have a master sharing agreement that governs allocation of property and sales tax for annexation of new land. Fresno General Fund receives an average of 22.1 percent (actual allocations differ by tax rate area) of the 1 percent property tax and 1 percent of retail sales. If land is annexed to the City, EPS estimates that the General Fund will receive an average of 15.2 percent of the 1 percent property tax and 0.95 percent of retail sales with the remainder (the difference between those generated by land within the city) retained by the County. Actual property tax and sales tax allocations from annexation will vary by specific location (for property tax) and based on the timing of development (sales tax).

3. Would implementation of CFD financing on all new greenfield developments provide a more viable solution to generating sufficient revenues to cover municipal services costs?

Yes. However, while CFD financing is commonly utilized to cover public works expenditures, this funding is less common to cover other municipal costs, such as police and fire. However, this financing mechanism has been implemented in some cities and could be established in Fresno. Because police and fire cost represent at least 80 percent of new General Fund cost, establishing CFDs for public works alone would not solve the structural deficit associated with the optimal service level.

4. Can you be more precise in comparing the cost efficiency of nonresidential greenfield development versus residential development?

While our analysis does not compare nonresidential greenfield development to residential development, it does compare the following:

a) Residential and nonresidential development
b) Greenfield and infill development

A) In general, the analysis finds that residential development is slightly less favorable than nonresidential (e.g., retail, office, industrial) from a fiscal perspective primarily because of public service costs. Specifically, the cost of providing public services per net increase in assessed value is higher for residential than nonresidential development because residents generally create more service demands than do businesses and their employees. In addition, nonresidential property values are slightly higher than residential uses on a per acre basis. However, the City's long-term fiscal performance will ultimately depend on a balanced mix of land uses and a complex range of internal and external variables.

B) This analysis finds that infill development performs slightly better than greenfield development overall. However, this result appears to be driven primarily by General Fund revenues rather than cost. In other words, the relative cost of providing public services to infill versus greenfield locations appears negligible in aggregate (although individual projects can differ significantly). Although existing urban

areas may provide some economies of scale by relying on existing infrastructure (e.g., roads, existing police sub-stations), greenfield areas benefit from other factors, such as the excess capacity of some existing fire stations and higher likelihood of assessment district formation to cover facility maintenance.

On the revenue side, the key fiscal disadvantage of greenfield development relates to annexation. Specifically, as the City gets increasingly built out, a portion of new growth will need to be accommodated on land currently controlled by the County that will need to be annexed by the City. The existing tax sharing agreement between the City and the County, described above, provides less favorable terms to the City for property and sales tax growth capture relative to those the City could realize in its existing areas. As a result, new growth that will occur on annexed land will likely result in lower property and sales taxes relative to new development within existing City boundary.

The results reflect a holistic approach where no single land use is disproportionately developed going forward. While these findings hold true in aggregate, the fiscal performance of specific projects may vary significantly on the margin based on specific location within the City and market and economic factors. Ultimately, market demand will play a key role in a viable distribution of land uses for the General Plan. For example, if land for commercial uses is over-zoned, additional fiscal benefits will be marginal because of increased vacancies.

San Joaquin Valley Demographic Forecasts 2010 to 2050

March 27, 2012

Prepared for:

Fresno Council of Governments
2035 Tulare Street, Suite 201
Fresno, CA 93721
559.233.4148
www.fresnocog.org
Contact: Kathy Chung

On behalf of the eight San Joaquin Valley regional planning organizations:

- Fresno Council of Governments
- Kern Council of Governments
- Kings County Association of Governments
- Madera County Transportation Commission
- Merced County Association of Governments
- San Joaquin Council of Governments
- Stanislaus Council of Governments
- Tulare County Association of Governments

Prepared by:

The Planning Center|DC&E
3 MacArthur Place, Suite 1100
Santa Ana CA 92707
714-966-9220
planningcenter.com
Contact: Steve Gunnells

Contents

List of Figures

List of Tables

Introduction

Purpose

This report presents demographic forecasts for the San Joaquin Valley and the eight county-wide Metropolitan Planning Organizations (MPOs) in the Valley. The MPOs may use these forecasts to assist in determining the impact of various development densities on the fiscal health of cities and counties in the San Joaquin Valley and identifying market demand for higher density residential housing projects associated with the preferred growth scenario of the San Joaquin Valley Regional Blueprint. Equally important, these forecasts can be incorporated into the common traffic model being developed for the MPOs. The forecasts may also be used to formulate items such as Sustainable Community Strategies required under SB 375 and the Regional Housing Needs Allocation, also required under state law.

Forecast Models

The MPOs selected The Planning Center|DC&E and Arthur C. Nelson, PhD, FAICP, Presidential Professor of City & Metropolitan Planning at the University of Utah, to prepare the forecasts. The forecast models consist of a separate spreadsheet model for each county and one for the entire San Joaquin Valley. This report summarizes and presents the results of these forecast models.

The forecast models have been developed to allow each MPO to update the underlying data each year as new data are published by state and federal agencies. The ability to update is an important component of the forecast model. The deep recession of 2008/09, the slow pace of the recovery, and the lingering effects of the collapse of the housing and financial markets have caused many demographic measures to deviate from long-term trends in the last few years. As American businesses and households pay down their debt and the economy returns to a more normal rate of unemployment, some of these measures will return to trend. At the same time, other demographic characteristics may represent a new normal. For example, many economists expect the non-accelerating inflation rate of unemployment will be about a percentage point higher than it was in the '90s. Proposed federal housing finance regulations adopted in response to the housing and financial market collapse (discussed in more detail in a subsequent section in this report) will likely reduce homeownership rates. Updating the models over the next few years will allow the forecasts to better capture those demographic characteristics that return to trend and those that are at a new normal.

Organization

Introduction

The remaining sections of the Introduction discuss some demographic and economic factors that will influence the demographic trends covered by this report.

Methodology

The Methodology chapter provides a technical description of the methodology and data sources used in the forecast models.

Primary Forecasts

Three demographic characteristics provide the foundation for the forecasts:

- Households
- Population
- Housing

Several different trends and measures have been analyzed and evaluated to develop the forecasts for these three characteristics. The Primary Forecasts chapter discusses the development of these models and summarizes the resulting forecasts.

Other Demographic Forecasts

The other demographic characteristics are all derived from the primary forecasts. These characteristics include:

- Age Distribution
- Average Household Size
- Household Income
- Household Type
- Race/Ethnicity

The Other Demographic Forecasts chapter discusses issues surrounding these characteristics and summarizes the results of the forecasts.

Regional Differences

The regional differences chapter provides additional analysis of the differences among the four largest metropolitan areas in the Valley and the differences between the urban and rural areas.

Appendix

The appendix provides a brief explanation of some of the terminology used in the report and provides detailed results of all of the forecast models.

Home Ownership Trend

One key demographic measure that is heading to a new normal, or perhaps returning to an old normal, is the home ownership rate.

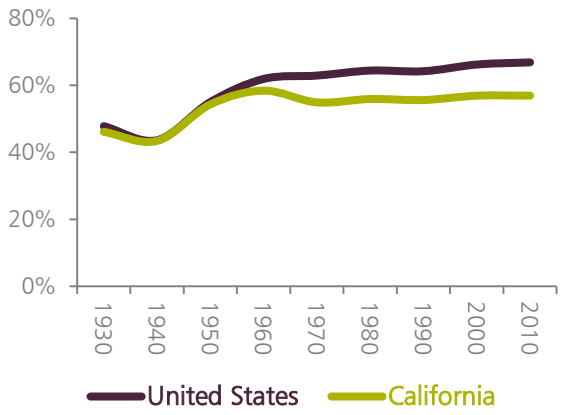
The Long-Term Trend

As shown in Figure 1, the portion of households owning their homes in the United States increased from the 1940 Census through the 2010 Census. In contrast, the home ownership rate in California peaked in 1960, declined from there, and only started increasing again after the 1990 Census.

Numerous public policies and social trends fueled the increase in home ownership. Most notable among these, however, were federal intervention in the mortgage market and rising incomes. Beginning in 1938, federally created agencies, such as the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac) created a secondary market for mortgages. These agencies bought mortgages from banks, thus allowing these banks to go out and issue new mortgages. This secondary market for mortgages transformed how housing was built and bought and sold in the United States. These agencies funneled vast new sums of money into the housing market, allowing the nation to go from primarily renter households to primarily owner households.

At the same time, economic expansion beginning in the post–World War II era resulted in decades of rising real wages for American workers. In the 1950s, household investment in housing accounted for 5.03 percent of national gross domestic product, the highest of any ten-year period in the postwar period.

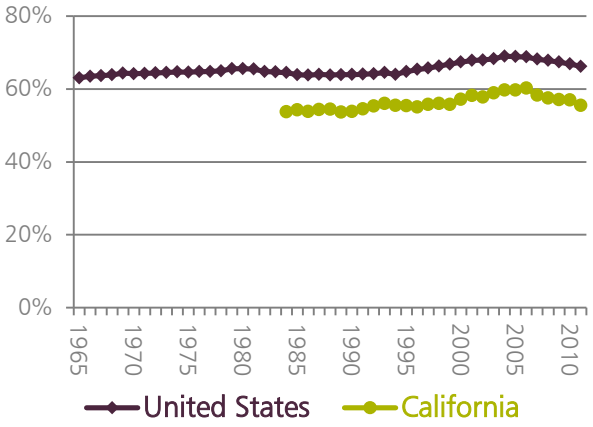
Figure 1: Home Ownership Rate from the Decennial Censuses, US and California, 1930 to 2010



The More Recent Trend

Figure 2 shows the rate of home ownership on an annual basis. Nationally, the generally increasing rate of ownership stagnated in the 1980s, then picked back up again in the 1990s, reaching a peak of 69.0 percent in 2004, and has since declined. As will be discussed in following sections, there are strong reasons to expect the national rate of home ownership to continue declining.

Figure 2: Home Ownership Rate by Year, US and California, 1965 to 2011



California's rate of ownership peaked slightly later, at 60.2 percent in 2006, but it has also since declined. Over the 28-year period from 1984 to 2011, California's home ownership rate averaged about 9.8 percentage points lower than that for the nation, 56 and 66 percent.

The Trend Going Forward

As discussed in the following sections of this paper, significant factors will likely continue to push the rate of home ownership downwards, and hence, increase the rentership rate. The factors include wages and incomes, housing finance, and demographics.

Wage and Income Trends

Real (inflation-adjusted) wages and salaries in the US steadily increased from the beginning of the post-war period through the early 1970s, stagnated through most of the 1970s and early 1980s, grew rapidly at the end of the 1990s, and has grown slowly since then. The total real wages and salaries per employed person in the third quarter of 2011, $41,600, was only 4.7 percent higher than that at end of the last major growth spurt, $39,739 in the first quarter of 2001. Considering the effects of high unemployment resulting from the last recession, the picture is even less rosy. Total real wages and salaries per labor force participant in the third quarter of 2011, $37,800, was 0.6 percent less than that in the first quarter of 2001, $38,100. Figure 3 shows the wage and salary data from the first quarter of 1948 through the third quarter of 2011.

Figure 3: Real Wages and Salaries, United States, 1948 to 2011

The data suggest that the typical household, including employed and unemployed persons, has no more money for housing payments than they had in 2000. Until unemployment returns to a more normal level, perhaps around 7 percent, real wages and salaries are unlikely to experience any significant growth. The Federal Reserve currently forecasts the economy will not return to full employment until the end of 2014, at the earliest. Thus, wages and salary income offer no prospect for supporting expansion in housing purchases in the short term, and the question of future wage and salary growth suggests a continuing constraint on affording home ownership. Interest rates and down payments affect the monthly payment that household income has to be able to afford for ownership. The next section explores down payment issues.

Housing Finance

In addition to income constraints, two factors of housing finance are likely to put downward pressure on the rate of home ownership, thus increasing the rentership rate.

Minimum Down Payment

In response to the housing market crash and the near collapse of the financial markets, most lenders increased their lending standards, requiring higher credit scores, lower debt to income ratios, and higher down payments. Of those making a down payment when financing a home purchase in 2009, 26.3 percent provided less than 5 percent down, 47.4 percent provided less than 10 percent down, and only 26.6 percent provided more than 20 percent down.

As part of the overhaul of the housing finance regulatory structure, a group of federal agencies are considering proposed rules that would effectively raise the minimum down payment required to obtain a residential mortgage from five percent to 10 or 20 percent. These rules would institutionalize some of the tighter lending standards that would otherwise likely ease over time.

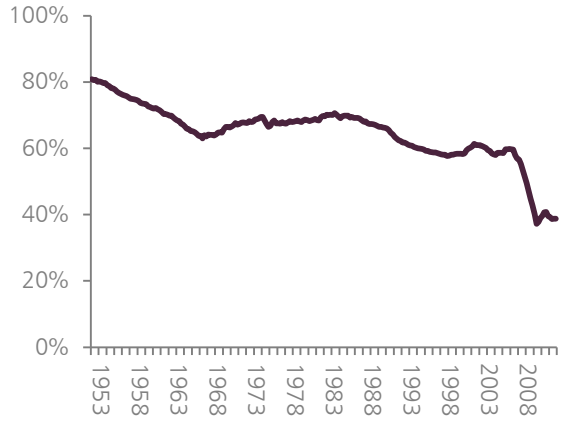
The National Association of Home Builders estimates that an increase to 20 percent would disqualify five million potential home buyers, reducing national housing sales by 250,000 per year. The Coalition for Sensible Housing Policy (CSHP) estimates that the increase from 5 percent to 10 percent would exclude 4 to 7 percent of potential home buyers.

CSHP further estimates that a shift from 5 to 10 percent down payment would extend the time it takes the average family to save the down payment from 6 to 9 years; a 20 percent down payment would require 14 years. What is not known is the degree to which the required years of savings would discourage potential home buyers from ever entering the market, perhaps deciding to rent and devote the 14 years of savings to education for their children.

Decreasing Home Equity

Many of those purchasing housing, however, are not saving for a down payment for a first house; rather, they are using the equity in the current house as the down payment on their next house. The American Housing Survey reports that more than half the number of home buyers who were not buying their first home used money from the sale of their previous house as the major source of their down payment in 2009. While the equity the average household has in its existing house has been declining across the postwar period, it declined dramatically with the fall in housing values following the housing market crash. The average equity dropped from 56.5 percent in 2005 to 39.2 percent in 2009. Figure 4 shows home owner equity from 1952 through 2011.

Figure 4: Homeowner Equity as a Portion of Housing Value, United States, 1952 through 2011



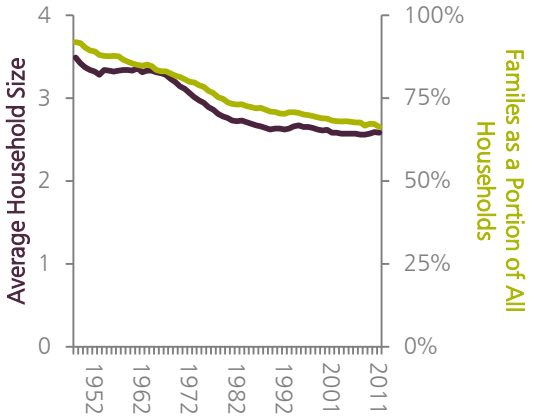
Source: The Planning Center|DC&E, 2011, using data from the Federal Reserve.

The decrease in home owner equity means that fewer households will be able to fund the down payment to purchase another house using their current equity. Over time, as households pay down their current mortgages and as housing values stabilize and begin to increase again, the steep drop in equity may reverse. Nevertheless, the long–term trend is that home owners have less and less equity, and at some point, the patterns of house purchasing and finance will have to adjust: less home equity financing or less frequent house purchasing.

Demographics

In the 20 years following World War II (1945 through 1964) the fertility rate increased substantially, creating the baby boom generation. Starting in 1965, a few years after the introduction of the birth control pill, the fertility rate declined dramatically, and has remained about the same level ever since. As the oldest of the baby boom generation began moving out of their parents' houses, the average household size began a long steady decline, from 3.36 persons per household in 1961 to 2.62 in 1989. Since 1989, the number of persons per household has averaged 2.61. During this same time frame, families as a portion of total households has steadily declined, from 91.9 percent in 1948 to 66.2 percent in 2011. Figure 5 shows these national household characteristics.

Figure 5: Household Characteristics, United States, 1949 to 2011



Source: The Planning Center|DC&E, 2011, using data from the US Census Bureau.

As the baby boom generation continues to transition from families with children to empty nesters and to move from employment to retirement, some portion will desire to sell their current family-sized houses and relocate to smaller housing units. There are substantially fewer households in the baby bust generation (those born from 1965 through 1973).

As previous generations retired and relocated, there were larger generations following them, ready to move into family-sized housing. With the coming generation change, however, there are fewer households that will be looking to buy housing from the baby boomers wanting to move.

The key to the housing market then becomes the echo boom generation, the children primarily of the baby boomers, born after 1973. Current survey research suggests that this generation, however, will have a higher preference for more urban housing and less of a preference for the traditional large-lot single-family detached houses. More importantly, though, lingering unemployment and lack of job growth coupled with changes in housing finance may force the echo boom generation to put off purchasing their first houses.

If there is insufficient demand to purchase housing that baby boomers desire to sell, the market result would be some combination of downward pressure on housing values, reduced selling, renting out existing housing that cannot be sold, and decreased housing production.

The long-term impact is uncertain. The survey research suggests that the housing preferences of the echo boom generation will drive changes to housing and development patterns. However, a precept of economics is to look at what people do, not what they say. No one can say with certainty that the echo boom generation, once they form families and have children of their own, will not emulate their parents and adopt a preference for traditional large-lot single-family detached houses.

Multigenerational Family Housing

Multigenerational family housing is a demographic and housing trend that will influence future housing demand. Multigenerational family housing is defined as a family household that contained at least two adult generations or a grandparent and at least one other generation.

Research by the Pew Research Center[1] found that this extended family living arrangement, which was common throughout our nation's history, began to fall out of favor after World War II. In 1940, about a quarter of the population, 39 million Americans, lived in an extended family household. By 1980, only 12 percent lived in such households. Since 1980, the portion of the population living in multigenerational family households has steadily increased, reaching 49 million people, or 16.1 percent of the population in 2008.

This increase includes all major demographic groups; however immigration from Latin American and Asia has driven a large portion of the increase. These immigrants, like those in earlier immigration waves, are more likely to live in extended family households than are native-born Americans.

While all age groups are more likely now than they were in 1980 to live in multigenerational family housing, it is young adults among whom the percentage increase has been the greatest. In 1980, 11 percent of those aged 25 to 34 lived in extended families; by 2008 the number had risen to 20 percent. The increase in median age at first marriage has been a primary driver of this long-term trend among young adults. However, in recent years the recession has added to the movement of young adults back home. In 2009 37 percent of 19- to 29-year olds were unemployed. A Pew survey that year found that one in eight of those aged 22 to 29 indicated that they had moved back in with their parents as a result of the recession.

Among those aged 65 and older, the portion living in extended family households increased from 17 percent in 1980 to 20 percent in 2008. Among this older generation, women are much more likely than men to live in an extended family, due in large part to women being more likely to outlive their spouse than men are. Among the 25 to 35 year olds, though, men are much more likely to be the ones living in multigenerational family households.

Because younger adults are more likely to rent than to own their residence, the trend of an increasing portion of young adults living in multigenerational family housing should lessen, although not reverse, the trend of increasing rentership and decreasing ownership. At the same time, the increasing movement of older Americans into extended family housing should decrease the total number of homeowners and put more housing on the market. Whether there are sufficient numbers of households in the baby bust and echo boom generations to absorb that housing will determine the degree to which it increases or decreases the ownership rate.

[1] See Taylor, Paul, et. al., "The Return of the Multi-generational Family Household." Washington DC: Pew Research Center (March 2010).

Migration

The demographic analysis conducted for the forecasts finds that migration is the primary factor driving differences in the development patterns among the eight counties. From 2000 to 2010, the population in each county grew faster than the natural rate of increase (number of births minus the number of deaths), and migration is the key difference. Who migrated to and from each county, their household characteristics, race and ethnicity, and the income their skills and education can command explain differences in the past and will drive the differences in the future.

Demographers often discuss migration push and pull factors, the factors that attract people to a region and those that push them out. Two in particular warrant additional discussion: economic growth and retirement.

Economic Growth

In the conventional model of regional development, economic growth leading to job growth attracts migration and helps retain younger people entering the labor force. In contrast, regions with stagnant or declining economies fail to attract many migrants and fail to retain their own residents, who often migrate away in search of better economic opportunities.

Each of the eight counties attracted migrants in the previous decade. Some of these may have come to fill low-wage farm laborer jobs while others may have come to work in higher-skilled higher-paying occupations, such as teaching, medical care, or accounting.

The total increase in employment is one key factor pulling migrants to a region. Kern, Kings, and Madera counties had the highest rates of job growth from 1990 to 2010, and they had the highest rates of population growth. Tulare County had a higher jobs growth rate than the Valley as a whole but a slightly lower population growth rate. Job growth in Tulare, however, might have more often been filled by those previously out-commuting to jobs in Fresno and Kern counties. Relative to the Valley, the other five counties had lower rates of job growth and population growth.

While the total number of jobs correlates to population growth, the types of jobs correlate to a variety of other demographic characteristics. For example, farm employment in the San Joaquin Valley increased by 20,800 jobs from 1990 to 2010, at about half the rate of overall job growth. Fresno, Merced, San Joaquin, and Stanislaus counties had a decrease in farm jobs over this time. However, Kern and Tulare counties had faster growth in farm jobs than in total jobs. Indeed, Kern County accounted for three quarters of the Valley's farm job growth, and farm jobs made up nearly a quarter of the county's total job growth.

During this same period, jobs in the professional, scientific, and technical services sector in the Valley increased by 33,500, at a rate a little less than double that for overall job growth. In all of the counties, employment in this sector increased faster than overall job growth. In Madera County, however, this relatively high-paying sector accounted for 18.2 percent of all of the county's job growth, and Madera County provided 19.1 percent of the Valley's job growth in this sector.

While many factors influence median household income, changes in the types of jobs are a key driver of changes in income. From 1990 to 2010, Kern County's real (inflation-adjusted) median household income decreased at a 0.1 percent per year rate, while Madera County's increased at 0.5 percent per year rate. Clearly more is at play in these income differences than just farm and professional jobs, but the magnitude of these employment and income differences in the two counties underscores the importance of economic growth and development in the future of the San Joaquin Valley.

Retirement

Retirement is the second major factor than can noticeably alter population growth. With the looming retirement of the baby boom generation over the next 20 years, this factor may influence future demographics more so than in the past.

There are three general avenues taken after retirement, at least in the past. The largest group, perhaps a majority, remain in their existing home. The other retirees split about equally between moving to another region and moving to another home, perhaps smaller, in the same region.

How big of an issue is this in the San Joaquin Valley? Data from the 2010 American Community Survey indicates that 92 percent of the population age 65 and older lived in the same house that they did a year earlier, and 5 percent moved from a different house in the same county as their current residence.

So only 3 percent had moved from another county or state or from abroad, fewer than the 5.3 percent of the total population that had moved into a San Joaquin Valley county in the past year.

Across the San Joaquin Valley, the population age 65 and older accounted for 5.5 percent of the in-migration in the past year. In three counties, however, this age group accounted for a larger share of in-migration: Fresno at 7.6 percent, San Joaquin at 7.7 percent, and Stanislaus at 6.8 percent. At the other end of the spectrum, this age group comprised only 3.1 percent of in-migration in Kern County, 2.7 percent in Kings, and 4.3 percent in Madera.

Because retirees can generally obtain the same benefits regardless of where they live, they are able to more easily choose a home unrestrained by employment opportunities than the working age population. It is likely that proximity to the Bay Area explains part of this age group's share of migration into San Joaquin and Stanislaus County. More than half of this age group's in-migration to these counties comes from within California. In Fresno County, however, more than half of this age group's in-migration comes from other states and abroad. Indeed, it is the only one of the eight counties in which more older migrants come from out of state than come from elsewhere in California.

With the I-5 through the Grapevine and no rail access connecting Kern County and Los Angeles County, Southern Californian retirees probably do not perceive Kern County as a close-by place to retire (a place where they can find a less expensive and perhaps smaller home that is still within an easy drive to family and friends). The Inland Empire probably handles much of the Southern Californian retiree relocation that San Joaquin and Stanislaus counties provide for the Bay Area.

A big unknown for the San Joaquin Valley is what will happen with future retirees, not only the aging baby boomers in the Valley but also those in Northern and Southern California. If past trends are an indication, retiree relocation will affect each of the counties differently. And these differences will have impacts for public services, housing, medical care, and a variety of other public policy concerns.

Three demographic measures form the primary forecasts:

1. Number of Households
2. Total Population
3. Total Number of Housing Units

The primary forecasts are based on several different projections and the authors' professional judgment. The remaining demographic forecasts are derived from the primary forecasts. This chapter describes the methodology and data sources for individual projections.

Generally, for each demographic trend, the least-squares method determines a line that best fits the trend data. That line is projected to the year 2050, and the projection is the straight line that connects the last datum to the 2050 trend datum. The descriptions for each projection explain if the projection employs a different methodology.

The preparation of the forecasts explored different curve-fitting techniques (e.g., parabolic curve, logistics curve). In some cases, alternative curve-fitting models provided acceptable projections for a few years, but none provided reasonable long-term projections. The forecasts incorporate no alternative curve-fitting models, and the least-squares linear curve forms the basis for all projections because the metropolitan planning organizations will use the forecasts for long-term planning efforts with 10-, 20-, and 40-year horizons.

Three measures evaluate the adequacy of each projection: mean absolute percentage error (MAPE), F-test, and t-test. The Appendix provides the detailed results, and the following sections of this chapter summarize the relevant statistics.

Household Trend

The household trend projection uses the DOF estimates for the total number of households in each county for each year from 1990 through 2011. The data for the San Joaquin Valley are sum of the data for the eight counties.

The least-squares line for the San Joaquin Valley household trend produces a MAPE of 1.4% and a relative standard error of 1.7%. The relative standard errors in the individual county models range from a low of 1.1% in Kings County to a high of 3.2% in Merced County.

Vacancy Rate

The vacancy rate analysis uses the DOF estimates of the vacancy rate from 1990 through 2011. The vacancy rate data for the San Joaquin Valley for each year were derived by dividing the total number of occupied housing units across the eight counties by the total number of housing units across the eight counties.

For all eight counties and the entire Valley, the least-squares line indicates an increasing vacancy rate, and in all nine models, the projected vacancy rate through 2050 would exceed the highest observed vacancy rate. Nevertheless, all nine models produced F-statistics and t-values that exceeded the critical values.

Instead of using the best-fit line to project increasing vacancy rates over the next 38 years, the projection models assume that the long-term vacancy rates will return to the average rate for the period from 1990 through 2011. The models assume that the vacancy rate will decrease in a straight line from the 2011 data to the average in 2016.

For the San Joaquin Valley, the average vacancy rate, and hence the long-term projection, is 6.77%. For the eight counties, the average vacancy rates range from a low of 4.44% in San Joaquin County to a high of 9.94% in Madera County.

Total Housing Units Trend

The total housing units trend projection uses the DOF estimates of the total number of housing units in each county from 1990 through 2011. The data for the Valley are the sum of the data for the eight counties.

The least-squares line for the Valley total housing unit trend produces a MAPE of 1.4% and a relative standard error of 1.63%. The relative standard errors in the individual county models range from a low of 1.11% in Kings County to a high of 2.73% in Merced County.

The projected vacancy rates are applied to the projected total number of housing units to derive a projection of the total number of households. This

projection of the total number of households produces a MAPE of 1.53% for the San Joaquin Valley. For the eight counties, the MAPE ranges from a low of 0.94% in Kings County to a high of 2.86% in Merced County.

Housing Units Constructed Trend

The projection model based on the number of housing units constructed uses DOF-provided data on the total number of housing units permitted each year. For 1991 through 1999, the data reflect the difference in the total number of housing units from the previous year. For 2000 through 2011, the data are the number of housing units constructed and were provided by DOF for this project.

Because the number of housing units constructed each year is small compared to the total number of units, the housing construction data exhibit a higher degree of variability than do the total housing units data.

The least-squares line for the total number of housing units constructed in the San Joaquin Valley produces a MAPE of 71.4% and a relative standard error of 11.49%. More importantly, the least-squares line fails both the F-statistic and t-value check. Thus, one cannot accurately say that the number of housing units constructed each year represents a consistent trend that can be projected forward. Therefore, the forecast for the total number of housing units combines the projection based on housing units constructed and the total number of housing units..

Across the eight counties, the relative standard error ranges from a low of 9.51% in Kings County to a high of 16.41% in Merced County. The data for five of the counties fail both the F-statistic and t-value test. However, in three counties, Madera, San Joaquin, and Tulare, the data fail the t-value test but not the F-statistic test.

Housing Units by Type Trend

As with the housing units constructed, data on the number of housing units by type exhibits a great degree of variability, even more so than the total housing units constructed data. This is particularly true for multifamily housing because there are even fewer such units constructed in each county and because they are often constructed in larger projects, resulting in large changes in the number of units from year to year.

The least-squares line for the number of housing units constructed by type in the San Joaquin Valley produces a MAPE of 27.4% for single family, 123,7% for multifamily, and 54.5% for other housing types and a relative standard error of 33.9% for single family, 81.0% for multifamily, and 97.1% for other housing types. The least-squares lines fail only the t-test and then only for single family and for other housing types. The data across the counties produce similar results.

Because the actual data exhibit such variability, the forecast model uses the results of the construction by housing type to project each housing type's relative share of housing and then applies those proportions to the projected number of total housing units.

Employment Trend

The projection model based on the employment trend uses at-place employment by sector data from the CA Employment Development Department. The data for the San Joaquin Valley are a sum of the data for the eight counties. The model constructs a least-squares line for each economic sector, projects that forward, and sums the results to generate a projection for total employment in each county.

The least-squares line for total employment in the entire Valley produces a MAPE of 1.97% and a relative standard error of 2.99%. The relative standard error among the counties ranges from a low of 2.12% in Tulare to a high of 5.23% in Madera.

The model calculates a jobs-to-household ratio by dividing the actual employment in each year by the DOF-estimated number of households. Dividing the projected total employment by the projected jobs-to-household ratio provides a projection of the number of households.

The least-squares line for the jobs-to-households ratio in the San Joaquin Valley generates a MAPE of 2.71% and a relative standard error of 3.36%. Among the counties, the relative standard area varies from a low of 2.75% in Tulare to a high of 5.54% in Madera.

Cohort-Component Model

A standard cohort-component model was developed for each county and for the Valley-wide fore-

casts. The model uses data from the 2000 and 2010 census for age by gender in five-year age cohorts for each county, summing the county data to generate totals for the Valley. The model uses fertility data from the CA Department of Public Health's births statistical data tables for each county from 2005 through 2009. For Valley-wide fertility rates, the model calculates the number of births in each year, sums the births by age cohort of the mother, and divides those by the number of women DOF estimates for each age cohort in each year. The model calculates five-year survival rates for each age cohort using data from the California Abridged Life Tables, 2004. The survival rate data are not broken down by county. Finally, the model applies the survival and number-of-births data to the 2000 and 2010 Census data to estimate the migrations rate by gender and age cohort. The model also adjusts the migration rate data for the 5 to 9 and 10 to 14 age cohorts based on school enrollment data for each county.

With the exception of Stanislaus County, the cohort-component model projects a substantially larger population in 2050 than do the population trend and the household trend models. Therefore the population forecasts weigh cohort-component model for only 10% of the forecast, compared to 45% for the two other projections. It is not clear why the cohort-component model produces a smaller projection than the other two models for Stanislaus County.

The results of the cohort-component model are fitted to the final population forecast in order to generate the forecast for the age distribution. For each forecast year, the unadjusted cohort-component model projections are converted to percentage and the percentage for each age group is then multiplied by the population forecast.

Total Population Trend

Three different population trend projection models are used. In three of the counties and Valley-wide, the population in correctional facilities makes up a large percentage of the total group quarters population: Kern County, 85.3%; Kings County, 87.5%; Madera County, 90.3%; and the San Joaquin Valley, 68.1%. For these four, the model generates a projection for the household population and the group quarters population using estimates from DOF for 1990 through 2011. The model then assumes that the portion of the group quarters population in correctional facilities in 2010 will increase at the projected population growth for California. The model projects the state's population growth using a least-squares line generated from the DOF estimated population for 1990 through 2010. It assumes that the non–correctional facilities group quarters population will increase at the rate determined by the least-squares line for the total group population estimates from 1990 to 2011. The projected household population and the projected group quarters population are summed to generate the population trend projection for future population.

For four of the counties, Fresno, San Joaquin, Stanislaus, and Tulare, the model generates a least-squares line for the total population and uses this line to project future population. The model uses a least-squares line for the household population and group quarters population, projects these forward, and converts each population type's share of the sum total into a percentage. These percentages are applied to the final population forecast to generate the final projection for household and group quarters populations.

The third population trend model is used for Merced County because UC Merced will generate a significant increase in student population, in households, and in group quarters. But because UC Merced did not open in 2005, the population trend data would not adequately capture that potential growth. The model uses a least-squares line to project the total population, household population, and group quarters population without the students at the university since 2005. The model assumes that the university will reach its target student enrollment of 11,000 in 2020 and applies the growth rate needed to reach that target in the years after 2020 until the student population reaches 25,000. While the university anticipates housing half of these students on campus, in 2011 only about a third of the students lived in on-campus housing. The model assumes that the on-campus population will reach the 50% target in 2050, ten years after the model projects it will reach its buildout goal of 25,000 total students.

Average Household Size Trend

The average household size trend projection model uses data from the 1990, 2000, and 2010 Censuses. The model also adjusts the average household

size based on race and ethnicity, using Census data from 2000 and 2010. The projections use the following race classifications: White alone; Black or African American alone; American Indian and Alaska Native alone; Asian alone; Native Hawaiian and Other Pacific Islander alone; Some other race alone; and Two or more races. The model provides a separate adjustment with the following ethnic categories: Hispanic; and White alone, non-Hispanic.

For the basic average household size projection for the San Joaquin Valley, the least-squares line produces a MAPE of 0.3% and a relative standard error of 0.62%. Because there are only three data points, though, one should expect a lower standard error than found with some of the previously described projections. The same process is used to project the average household size by housing type: single family, multifamily, and other.

Because the Census Bureau has changed how it collects and reports race and ethnicity data, the race/ethnicity adjustment to average household size uses only data from the 2000 and 2010 Censuses. The model uses the two data points for each race and ethnic classification to project the population and number of households for each forecast year. These projections are then adjusted on a percentage basis to reflect the population and households forecasts. The total population and total households are summed across race and ethnic categories and divided to provide the race/ethnic adjusted average households size in each forecast year. To calculate the average household size by housing type, the model applies the percentage change between the basic average household size projection and the race/ethnic adjusted average household size to the basic average household size by housing type.

The issue of future household sizes is complex yet very important to regional planning. Later sections in this report discuss this issue in great detail.

Age of Head of Household

The age of head of household trend projection model uses Census data from 1990, 2000, and 2010 for the number of household heads in 10-year age cohorts from age 15 through 75 and above. The data are converted to a percentage representing each age cohort's share of the total number of household heads. The model then uses a least-squares line to project the proportionate shares forward. The resulting projections are then adjusted such that each cohort's five-year change in share of households represents the average of the change from the initial projection and the change in the total population in that age cohort resulting from the cohort-component model. This adjustment is made so that the final projections reflect the changing age structure expected in the Valley through 2050 and not just the past trend in age of head of household. However, the full weight of the cohort-component model is not warranted because that model represents total population and not just household heads.

The final percentage projections are then applied to the household forecast to determine the projected number of household heads by age group. While the initial data and all of the projections are in 10-year age cohorts, the summary tables include only those age categories needed for the traffic model.

For the San Joaquin Valley, the least-squares lines for all age cohorts fail the t-test but satisfy the F-statistic test. The relative standard errors range from a low of 2.07% for the 15 to 24 age cohort to a high of 11.38% for the 55 to 64 age cohort.

Household Income Trends

There are two projections models for household income, one for the distribution of households among income categories and the other for the median household income, adjusted for inflation. The two models use data from 1990 and 2000 Censuses and data from the 2010 1-Year American Community Survey. For the Valley-wide model, average income is used instead of median household income because the median for the region cannot be derived from the median for each county.

For the distribution of households among income categories, the initial Census data are in the following classifications: Less than $10,000; $10,000 to $14,999; $15,000 to $24,999; $25,000 to $34,999; $35,000 to $49,999; $50,000 to $74,999; $75,000 to $99,999; $100,000 to $149,999; and $150,000 or more. However, for the traffic model, the data reflect classifications that were available in the 2000 Census but which the Census Bureau no longer uses. The projection model uses the classifications identified above to maintain the integrity of the original data. The final projections are converted into those needed for the traffic model based on the latter classifications' share of the households in the 2000 Census.

The distribution of households among income categories are adjusted for race and ethnicity, using Census data from 2000 and 2010. The final projections are an average of the number of households projected by the unadjusted model and the number of households projected by the race- and ethnicity-adjusted model.

Household Type Trend

The household type trend projection model uses Census data from 1990, 2000, and 2010. The model projects the number of households in four categories: Family households with children under age 18; Family households without children under age 18; Single person households; and All other non-family households. The original Census data represents the total number of households in each type. The model converts the number of households into each category's share of the total number of households.

For each category, the model uses a least-squares line to project the percentage of households for each forecast year. These projections are then multiplied by the household forecast to yield the number of households in each category.

Race and Ethnicity Trend

The race and ethnicity trend projection model uses Census data from 2000, and American Community Survey data from 2010 for the population in the following race and ethnicity categories: White alone, non-hispanic; Hispanic, all races; Black or African American alone, non-hispanic; American Indian and Alaska Native alone, non-hispanic; Asian alone, non-hispanic; Native Hawaiian and Other Pacific Islander alone, non-hispanic; and Some other race alone or in combination, non-hispanic.

The projection model uses a least-squares line for each category to project the future population. For each forecast year, the projected population is converted into each category's share of the population. Those percentage shares are then multiplied by the population forecast to yield the final forecast of population by race and ethnicity.

The three primary forecasts are number of households, population, and housing units. The other forecasts are derived from the primary forecasts. This chapter summarizes and discusses the primary forecasts, and the next chapter covers forecasts for the other remaining demographic characteristics.

Household Forecast

A household is one or more people who occupy a housing unit. And a house, apartment or other group of rooms, or a single room is regarded as a housing unit when it is occupied or intended for occupancy as separate living quarters; that is, when the occupants do not live and eat with any other persons in the structure.

Because housing tends to be the single largest expenditure for most households, the household often is the basic unit of analysis in economic research. The household is also an important unit of analysis in planning research because households make choices on where to live and housing often has the longest lifetime of real estate development products.

The household forecast is based on an assessment of five separate projection models:

1. Household Trend. This projection is based on the total number of households from 1990 through 2011.
2. Total Housing Units Trend. This projection is based on the total number of housing units and the projected vacancy rate.
3. Housing Construction Trend. This projection is based on the total number of housing units constructed and the projected vacancy rate.
4. Employment Trend. This projection is based on the total number of jobs and the projected jobs-housing ratio.
5. Cohort-Component Projection. This projection is based on the total population projected by a cohort-component model and the projected average household size.

Valley-wide Forecast

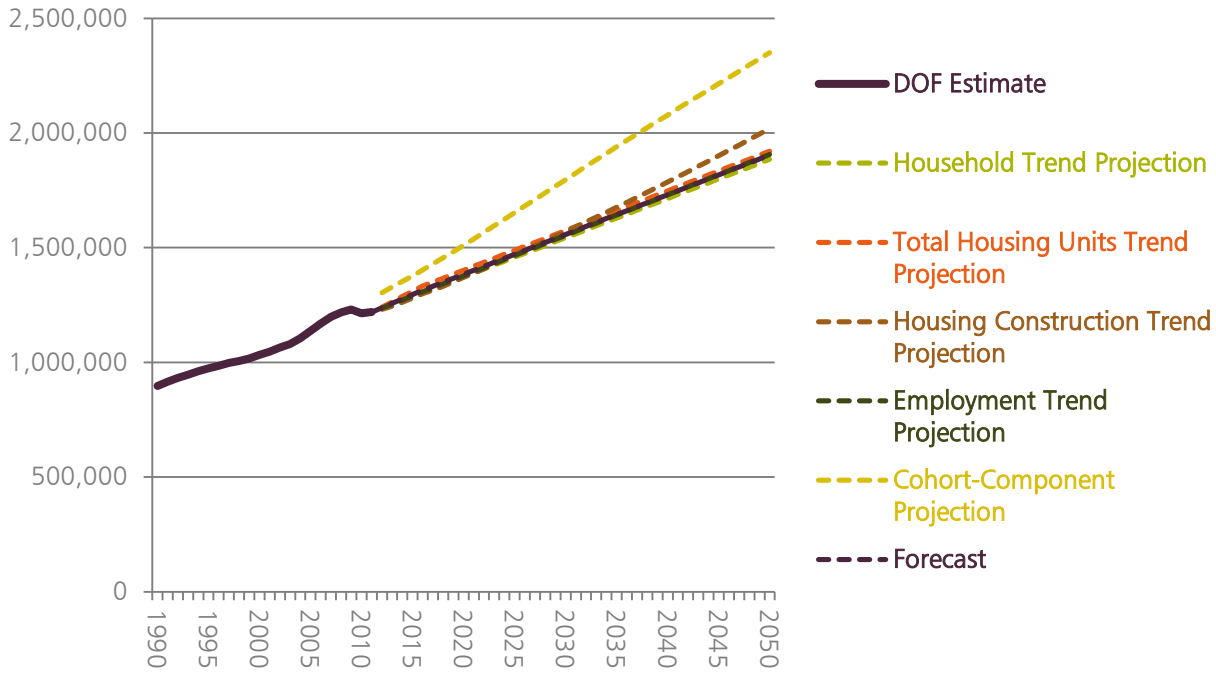
Table 1 shows the household projection generated by each of these five models for the San Joaquin Valley and Figure 6 compares them graphically.

Table 1: Comparison of Five Household Projection Models, San Joaquin Valley, 2010 to 2050

Year	Household Trend Projection	Total Housing Units Trend Projection	Housing Construction Trend Projection	Employment Trend Projection	Cohort-Component Projection
2010	1,214,000	1,214,000	1,214,000	1,214,000	1,214,000
2015	1,288,000	1,310,000	1,280,000	1,290,000	1,376,000
2020	1,373,000	1,402,000	1,370,000	1,378,000	1,510,000
2025	1,458,000	1,488,000	1,468,000	1,466,000	1,652,000
2030	1,544,000	1,575,000	1,570,000	1,554,000	1,797,000
2035	1,629,000	1,661,000	1,676,000	1,642,000	1,940,000
2040	1,715,000	1,748,000	1,786,000	1,730,000	2,080,000
2045	1,800,000	1,834,000	1,901,000	1,819,000	2,210,000
2050	1,885,000	1,921,000	2,020,000	1,907,000	2,350,000
Increase 2010 to 2050:	671,000	706,000	805,000	692,000	1,136,000
Annual Growth Rate:	1.11%	1.15%	1.28%	1.13%	1.67%

Source: The Planning Center|DC&E, 2012

Figure 6: Comparison of Household Projections, San Joaquin Valley, 1990 to 2050



Source: The Planning Center|DC&E, 2012.

The forecast for total households is based on the household trend projection, the total housing units trend projection, and the employment trend projection, with each weighted equally. The forecast does not use the housing construction trend projection because the data have a higher degree of variability than do the data in the three projection trends that are used. The forecast also does not use the cohort-component model because its projections are significantly higher than those produced by the other trend projections. Also, because the cohort component model represents the sum of many small projections—one for each five-year age increment—plus assumptions that fertility, survival, and migration rates remain constant over time, the household projections derived from the cohort-component model are inherently less reliable than those produced by the other projection models.

Eight Counties Forecasts

The models for seven of the eight individual counties use the same methodology to generate the forecast for total number of household: equal weighting of the household trend projection, the total housing units projection, and the employment trend projection. For Tulare County, the household forecast using this same model generates a projected household growth rate that is substantially lower than the population and housing unit forecasts. Therefore, the Tulare County forecast for total households uses the household trend projection, the total housing units projection, and the employment trend projection, each weighted at 0.3, and the housing construction trend projection, weighted at 0.1.

Table 2 summarizes the forecasts for total number of households for each county in the San Joaquin Valley. Figure 7 graphically compares the DOF estimates for total number of households from 1990 to 2011 and the forecasts from 2011 to 2050 for each of the eight counties.

If present trends continue, all eight counties would continue growing in the number of households. The 40-year growth would range from 22,200 household in Kings County to 145,000 in Fresno County. The annual household growth rate would range from a low of 1.0% per year in Fresno and Tulare counties to a high of 1.3% per year in Madera and San Joaquin counties. Tulare and Fresno counties

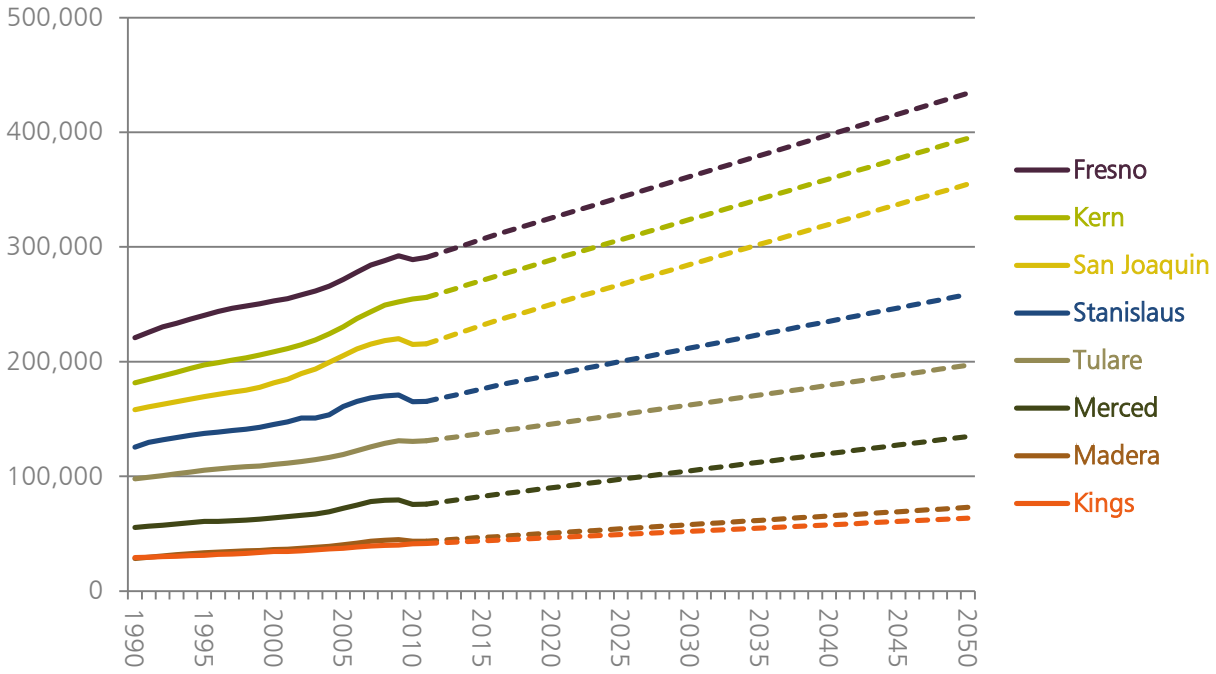
would increase in households at less than the Valley-wide rate; Kern, King, and Stanislaus counties at about the Valley-wide rate; and Madera, Merced, and San Joaquin counties at a faster rate.

Table 2: Forecast for Total Number of Households, Eight San Joaquin Valley Counties, 2010 to 2050

Year	Fresno	Kern	Kings	Madera	Merced	San Joaquin	Stanislaus	Tulare
2010	289,000	255,000	41,200	43,300	75,600	215,000	165,200	130,400
2015	307,000	271,000	43,700	46,600	82,400	232,000	176,300	137,400
2020	325,000	289,000	46,500	50,500	90,000	250,000	188,500	145,600
2025	343,000	306,000	49,300	54,200	97,500	267,000	200,000	153,900
2030	362,000	324,000	52,200	57,900	104,900	285,000	212,000	162,400
2035	380,000	342,000	55,000	61,700	112,400	302,000	224,000	170,900
2040	398,000	359,000	57,800	65,400	119,800	320,000	235,000	179,500
2045	416,000	377,000	60,600	69,200	127,300	337,000	247,000	188,200
2050	434,000	395,000	63,400	72,900	134,700	355,000	259,000	197,000
Increase 2010 to 2050:	145,000	140,000	22,200	29,600	59,100	140,000	93,800	66,600
Annual Growth Rate:	1.0%	1.1%	1.1%	1.3%	1.5%	1.3%	1.1%	1.0%

Source: The Planning Center|DC&E, 2012.

Figure 7: Comparison of Estimates and Forecasts for Total Number of Households, Eight San Joaquin Valley Counties, 1990 to 2050



Source: The Planning Center|DC&E, 2012, using DOF estimates for total number of households from 1990 to 2011.

Note: In this and subsequent charts, solid lines represent actual or estimated data and dashed lines indicate projections or forecasts.

County Total and Valley-wide Comparison

The question naturally arises as to what the difference is between the projection results for the eight individual county models and the projection results of the Valley-wide model. Table 3 presents the data for this comparison.

The difference between the summed total of the eight counties and the Valley-wide forecasts is a mere 6,000 households, less than 1%.

Table 3: Comparison of Eight County and Valley-wide Forecasts for Total Number of Households, 2010 to 2050

Year	Summed Total of the Eight Counties	Valley-wide Forecast
2010	1,214,000	1,214,000
2015	1,296,000	1,296,000
2020	1,385,000	1,384,000
2025	1,472,000	1,471,000
2030	1,560,000	1,558,000
2035	1,647,000	1,644,000
2040	1,735,000	1,731,000
2045	1,822,000	1,818,000
2050	1,910,000	1,904,000
Increase 2010 to 2050:	696,000	690,000
Annual Growth Rate:	1.1%	1.1%

Source: The Planning Center|DC&E, 2012.

Population Forecast

Population refers to the total number of people living in a geographic area. For demographic purposes, population is often divided into two categories: household population and group quarters population. Household population includes all people living in housing units and those that are homeless. Group quarters population includes people living in institutional facilities—including correctional institutions, college dormitories, and assisted living facilities.

The population forecasts cover the total population. As discussed in the Methodology chapter, however, in some cases the forecasts for the individual counties have been adjusted to reflect particular circumstances with group quarters. Nevertheless, the forecasts for population reflect the total population, both household and group quarters. As discussed in the methodology chapter, the trend in household population and group quarters population are projected forward in order to divide the population forecast into the two categories.

The population forecast is derived from three projection models:

1. Population Trend. This projection is based on the total population from 1990 through 2011.
2. Household Forecast. This projection is based on the household forecast and the projected average household size.
3. Cohort-Component Model. This projection is based on the total population projected by a cohort-component model.

Valley-wide Forecast

The population forecast uses the results of all three projection models. Because the data for the population trend and household forecast models have less variability, the forecast gives these two models a larger weight, 0.45. The cohort-component model produces a projection that is higher than that produced by the other two projection models, but it does not have to be combined with a separate projection as in the household forecast. Therefore, the population forecast incorporates the projection from the cohort-component model, but gives it a weight of 0.1.

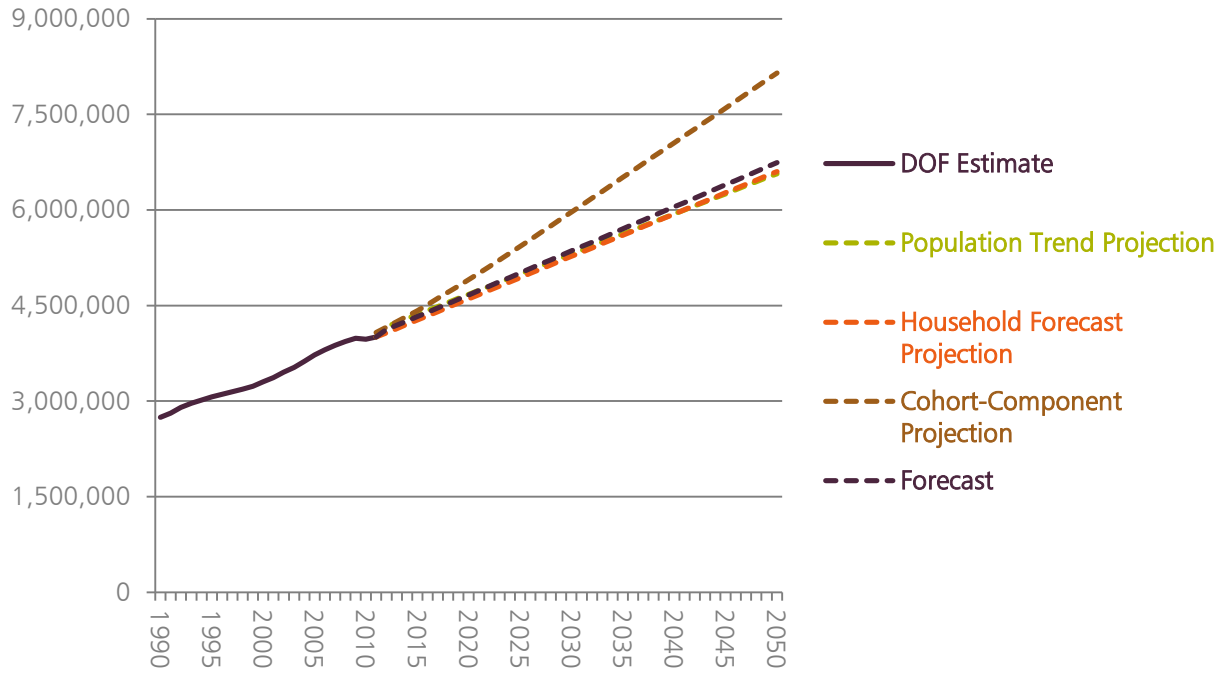
The Methodology chapter describes the process used to adjust the population trend projection to better account for the large portion of the group quarters population in correctional institutions.

Table 4: Comparison of Three Population Projection Models and the Population Forecast, San Joaquin Valley, 2010 to 2050

Year	Population Trend Projection	Household Forecast Projection	Cohort-Component Projection	Population Forecast
Weight:	0.45	0.45	0.10	
2010	3,970,000	3,970,000	3,970,000	**3,970,000**
2015	4,360,000	4,270,000	4,420,000	**4,330,000**
2020	4,680,000	4,600,000	4,900,000	**4,670,000**
2025	4,990,000	4,940,000	5,430,000	**5,010,000**
2030	5,310,000	5,270,000	5,970,000	**5,360,000**
2035	5,620,000	5,600,000	6,510,000	**5,700,000**
2040	5,940,000	5,940,000	7,050,000	**6,050,000**
2045	6,250,000	6,270,000	7,600,000	**6,390,000**
2050	6,570,000	6,600,000	8,150,000	**6,740,000**
Increase 2010 to 2050:	2,600,000	2,630,000	4,180,000	**2,770,000**
Annual Growth Rate:	1.27%	1.28%	1.81%	**1.33%**

Source: The Planning Center|DC&E, 2012.

Figure 8: Comparison of Population Projections and Forecast, San Joaquin Valley, 1990 to 2050



Source: The Planning Center|DC&E, 2012.

Eight Counties Forecasts

The population forecasts for each of the eight counties use the same methodology as the Valley-wide forecast, with the exception of Stanislaus County. For Stanislaus County, the cohort-component model project much lower total population than the other two models project. Therefore, the forecast model increases the weights for the population trend projection and the household forecast projection from 0.45 to 0.475 and reduces the weight of the cohort-component projection from 0.1 to 0.05. Also, as described in the Methodology chapter, the population trend projections for Kern, Kings, and Madera counties have been adjusted to reflect the high portion of the group quarters population in correctional facilities, and the population trend projection for Merced County has been adjusted to better account for the planned growth of the on- and off-campus student population at UC Merced.

Table 5 summarizes the forecasts for total population for each county in the San Joaquin Valley. Figure 9 graphically compares the DOF estimates for total population from 1990 to 2011 and the forecasts from 2011 to 2050 for each of the eight counties.

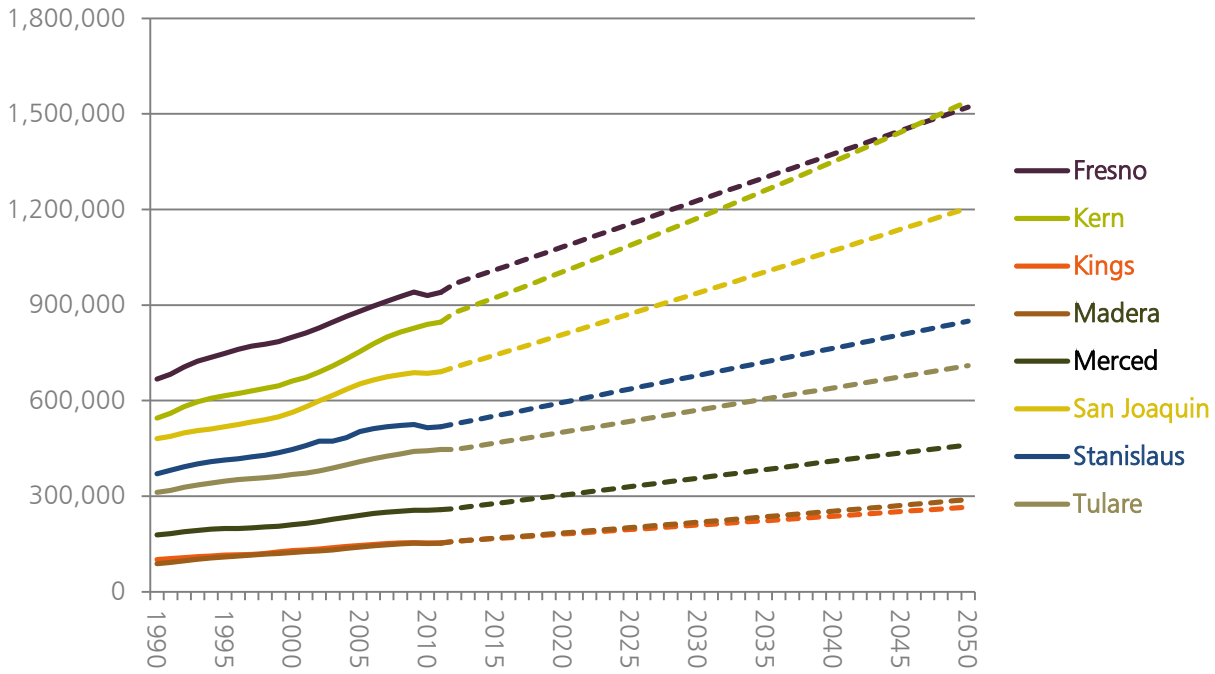
If present trends continue, all eight counties would continue to grow in population, with 40-year growth ranging from 113,000 in Kings County to 700,000 in Kern County. Stanislaus and Kings counties' populations would grow at about the same rate as the Valley as a whole; Fresno and Tulare counties would grow more slowly; and Kern, Madera, Merced, and San Joaquin would grow at a faster rate. The forecasts indicate that Madera County should grow to a larger population than Kings County in the near term, and Kern County would grow past Fresno County to become the largest population in the Valley over the long term.

Table 5: Forecast for Total Population, Eight San Joaquin Valley Counties, 2010 to 2050

Year	Fresno	Kern	Kings	Madera	Merced	San Joaquin	Stanislaus	Tulare
2010	930,000	840,000	153,000	150,900	256,000	685,000	514,000	442,000
2015	1,010,000	923,000	167,000	168,000	277,000	743,000	552,000	466,000
2020	1,082,000	1,004,000	181,000	184,500	303,000	807,000	594,000	501,000
2025	1,155,000	1,087,000	195,000	201,000	330,000	872,000	637,000	535,000
2030	1,228,000	1,173,000	209,000	218,000	356,000	938,000	679,000	570,000
2035	1,301,000	1,260,000	223,000	235,000	383,000	1,004,000	722,000	605,000
2040	1,374,000	1,349,000	237,000	253,000	410,000	1,070,000	764,000	640,000
2045	1,447,000	1,442,000	251,000	271,000	436,000	1,137,000	807,000	675,000
2050	1,521,000	1,540,000	266,000	289,000	461,000	1,204,000	849,000	710,000
Increase 2010 to 2050:	591,000	700,000	113,000	138,100	205,000	519,000	335,000	268,000
Annual Growth Rate:	1.2%	1.5%	1.4%	1.6%	1.5%	1.4%	1.3%	1.2%

Source: The Planning Center|DC&E, 2012.

Figure 9: Comparison of Estimates and Forecasts for Total Population, Eight San Joaquin Valley Counties, 1990 to 2050



Source: The Planning Center|DC&E, 2012.

County Total and Valley-wide Comparison

The Valley-wide model projects the Valley's population will reach 2,770,000 in 2050. This result is about 100,000 lower than the summed result of the eight individual county projections, or 3.6%. The cohort-component model projects a higher population than the other projection models, and summing the results simply magnifies the effect.

Table 6: Comparison of Eight Counties and Valley-wide Forecasts for Total Population, 2010 to 2050

Year	Summed Total of Eight Counties	Valley-wide Forecast
2010	3,970,000	3,970,000
2015	4,310,000	4,330,000
2020	4,660,000	4,670,000
2025	5,010,000	5,010,000
2030	5,370,000	5,360,000
2035	5,730,000	5,700,000
2040	6,100,000	6,050,000
2045	6,470,000	6,390,000
2050	6,840,000	6,740,000
Increase 2025 to 2050:	2,870,000	2,770,000
Annual Growth Rate:	1.37%	1.33%

Source: The Planning Center|DC&E, 2012.

Household and Group Quarters Population

As described in the Methodology chapter, the forecast for household and group quarters population is derived from the total population forecast. Table 7 summarizes the forecasts for household population in each of the eight counties and Valley-wide. The annual growth rate in household population varies from a low of 1.2% in Fresno County to a high of 1.7% in Madera County.

Table 8 summarizes the forecasts for group quarters population in each of the eight counties and Valley-wide. The annual growth rate ranges from a low of –0.1% in Tulare County to a high of 3.4% in Merced County.

Household population would account for the largest share of total population growth in Tulare County, where the group quarters population is projected to continue to decline. Household population would account for the smallest share of total population growth in Kings County. In Kings County, the large prison population, 12.6% of the total population in 2010, skews the demographics. The forecast model for Kings County separates out the group quarters population in correctional institutions, and group quarters constitutes a smaller share of total population in 2050 than in 2010.

Table 7: Household Population Forecasts, Eight Counties and the San Joaquin Valley, 2010 to 2050

	2010 Household Population	Share of Total Population	2050 Household Population	Share of Total Population	Increase 2010 to 2050	Annual Growth Rate	Share of Total Population Growth
Fresno	921,000	97.9%	1,488,000	97.8%	541,000	1.2%	97.6%
Kern	802,000	95.5%	1,473,000	95.6%	635,000	1.5%	95.7%
Kings	131,300	85.8%	229,000	86.2%	92,800	1.4%	86.6%
Madera	141,900	94.1%	274,000	94.8%	125,100	1.7%	95.5%
Merced	251,000	98.0%	441,000	95.7%	186,100	1.4%	93.1%
San Joaquin	669,000	97.6%	1,186,000	98.5%	497,000	1.4%	99.6%
Stanislaus	507,000	98.5%	838,000	98.6%	319,000	1.3%	98.8%
Tulare	436,000	98.7%	704,000	99.2%	263,000	1.2%	100.1%
San Joaquin Valley	3,850,000	96.9%	6,530,000	96.9%	2,540,000	1.3%	96.9%

Source: The Planning Center|DC&E, 2012.

Table 8: Group Quarters Population Forecasts, Eight Counties and the San Joaquin Valley, 2010 to 2050

	2010 Group Quarters Population	Share of Total Population	2050 Group Quarters Population	Share of Total Population	Increase 2010 to 2050	Annual Growth Rate	Share of Total Population Growth
Fresno	19,460	2.1%	33,600	2.2%	13,510	1.4%	2.4%
Kern	37,500	4.5%	67,200	4.4%	28,300	1.5%	4.3%
Kings	21,700	14.2%	36,700	13.8%	14,340	1.3%	13.4%
Madera	8,930	5.9%	15,160	5.2%	5,920	1.3%	4.5%
Merced	5,220	2.0%	19,840	4.3%	13,760	3.4%	6.9%
San Joaquin	16,170	2.4%	18,270	1.5%	2,120	0.3%	0.4%
Stanislaus	7,610	1.5%	11,470	1.4%	3,730	1.0%	1.2%
Tulare	5,760	1.3%	5,440	0.8%	-190	-0.1%	-0.1%
San Joaquin Valley	121,500	3.1%	207,000	3.1%	81,100	1.3%	3.1%

Source: The Planning Center|DC&E, 2012.

Total Housing Units Forecast

The total housing units forecast includes occupied and vacant housing units. It is perhaps the most challenging dataset to analyze because the number of housing units constructed varies considerably from one year to the next and because the vacancy rate also rises and falls as market conditions change.

Over the long term, the number of housing units is also a challenge to forecast. Changing family structures, changes in housing product types, housing preferences changing with age, and planning initiatives to promote more sustainable development patterns will all influence the rates and types of housing construction.

Nevertheless, good planning requires a good educated forecast of where current trends are heading. It also requires monitoring those trends over time to understand how trends are changing.

As used in this report, single-family housing includes single-family detached housing and attached housing, such as townhouses and row houses, as well as duplexes, triplexes, and quadplexes. Multifamily housing includes apartments and condominiums. The key difference between single-family attached and multifamily is where the units are attached. A unit is single-family attached if it has no other units above or below, regardless of how many units are attached at the side or rear. An attached unit is multifamily if it has one or more units above or below in the same building, regardless if there are units attached to the side or rear. Other units are primarily mobile homes, but this category also includes boats and recreational vehicles when they are used as a primary residence.

Valley-wide Forecast

As described in the Methodology chapter, the forecast for housing units uses a single projection based on the total housing units as estimated by DOF to forecast the total number of housing units. Separate projections based on number of units constructed are used to allocate the projected total number of housing units by type of housing.

Table 9 summarizes the forecast for the total number of housing units and the number of units by type. The forecast model indicates that the region's housing stock would increase by about 1.2% per year, but multifamily housing would grow faster, 1.4% per year, than single-family housing will grow, 1.1% per year.

Table 9: Housing Units Forecast, by Type of Housing, San Joaquin Valley, 2010 to 2050

	Total Housing Units	Total Single Family Units	Total Multifamily Units	Total Other Units
2010	1,331,127	996,763	246,219	83,375
2015	1,382,357	1,038,096	258,751	85,510
2020	1,450,676	1,088,224	274,227	88,225
2025	1,531,314	1,147,146	292,647	91,521
2030	1,624,270	1,214,862	314,010	95,397
2035	1,729,544	1,291,373	338,317	99,854
2040	1,847,138	1,376,678	365,568	104,891
2045	1,977,049	1,470,778	395,763	110,509
2050	2,119,279	1,573,672	428,901	116,707
Increase 2010 to 2050:	788,152	576,909	182,682	33,332
Annual Growth Rate:	1.2%	1.1%	1.4%	0.8%

Source: The Planning Center|DC&E, 2012.

Eight Counties Forecasts

The housing units forecast models are the same as the Valley-wide model. Table 10 summarizes the forecast increase in the total number of housing units and the increase in the number of units by housing type. The forecasts indicate that in Fresno, Kern, Kings, and Tulare counties, multifamily housing will increase at a faster rate than single-family housing. In Madera County, the trend in multifamily housing slopes downward very steeply. However, this is more of a statistical anomaly than it is a statement on market sentiment. Indeed, if Madera County were to add multifamily housing at the Valley-wide rate, it would add a total of 4,200 units through 2050, not just 1,894. Merced County is also something of an outlier. No adjustments were made to the housing unit forecast to account for student growth at UC Merced. If the university adds 12,500 students living off-campus, then the county could grow well beyond the 5,300 multifamily units that the trend suggests.

Table 10: 40-Year Increase in Housing Units, by Type of Unit, Eight Counties, 2010 to 2050

	Total Housing Increase	Annual Growth Rate	Single Family Housing Increase	Annual Growth Rate	Multifamily Housing Increase	Annual Growth Rate	Other Housing Increase	Annual Growth Rate
Fresno	171,785	1.1%	119,168	1.1%	48,492	1.2%	4,132	0.6%
Kern	200,599	1.3%	124,289	1.2%	61,880	2.0%	17,274	1.3%
Kings	21,852	1.0%	15,559	1.0%	6,611	1.6%	808	0.8%
Madera	31,320	1.2%	27,212	1.3%	1,894	0.7%	1,207	0.7%
Merced	59,423	1.4%	51,765	1.5%	5,362	0.8%	476	0.2%
San Joaquin	175,259	1.4%	146,908	1.5%	27,144	1.3%	4,807	1.0%
Stanislaus	123,359	1.3%	103,537	1.4%	14,861	1.1%	5,895	1.2%
Tulare	71,036	1.0%	48,716	0.9%	21,716	1.9%	603	0.1%

Source: The Planning Center|DC&E, 2012.

The remaining demographic forecasts are all derived from the primary forecasts. The demographics summarized in this chapter include:

- Age Distribution
- Average Household Size
- Household Income
- Household Type
- Race/Ethnicity

Because these forecasts do not employ multiple projections, the summaries in this chapter are shorter and more concise.

Age Distribution

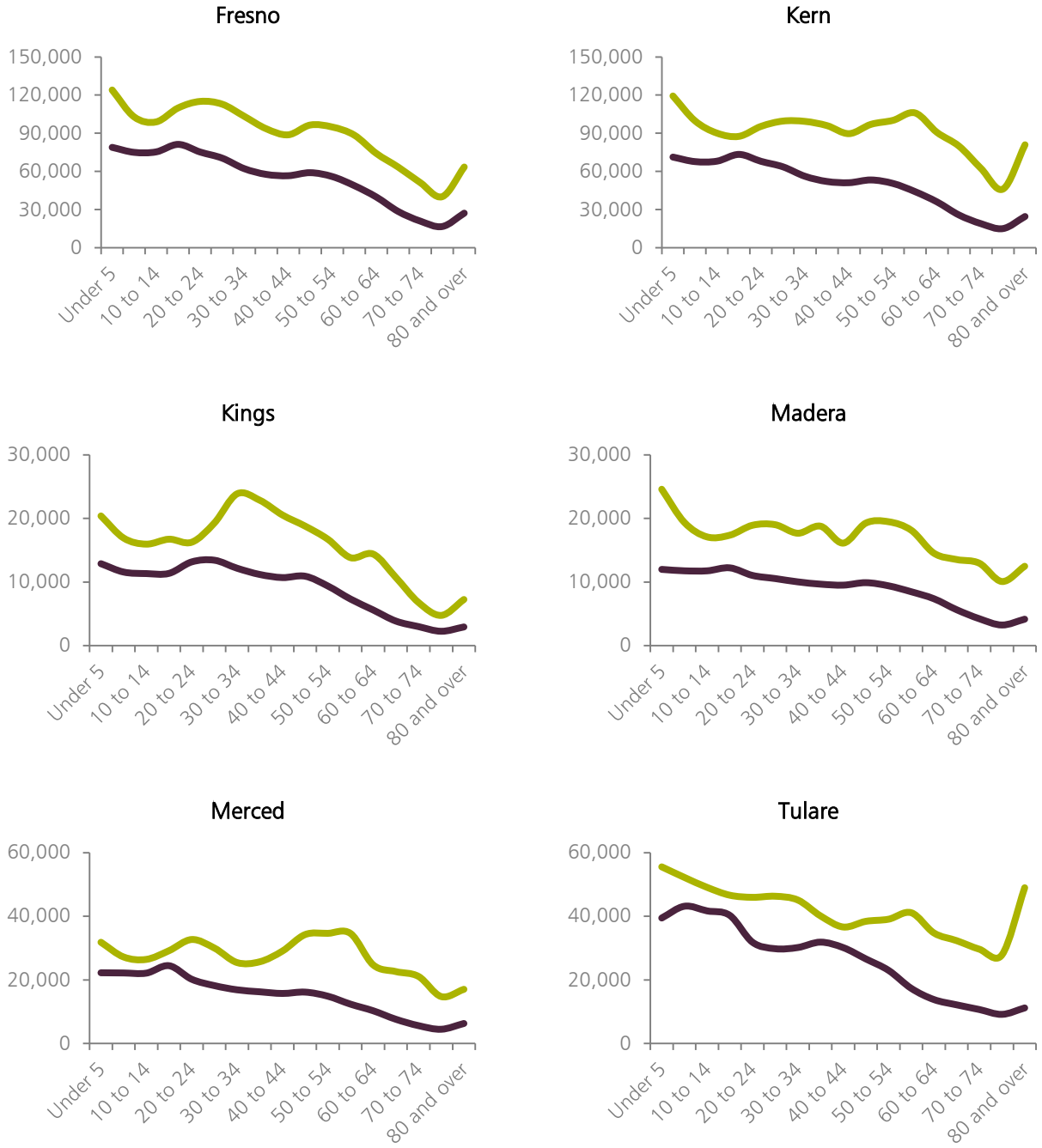
The forecast for age distribution uses the cohort component model to project the population in five-year age cohorts by gender, for every five-year period to 2050. The model uses standard five-year age cohorts (e.g., under 5, 5 to 9, 10 to 14, etc.). However, the traffic model requires age categories that more closely reflect the ages for attending the different levels of school. The forecast uses 1-year age increment data from the Census Bureau to divide the five-year age cohorts into the age categories needed for the traffic model.

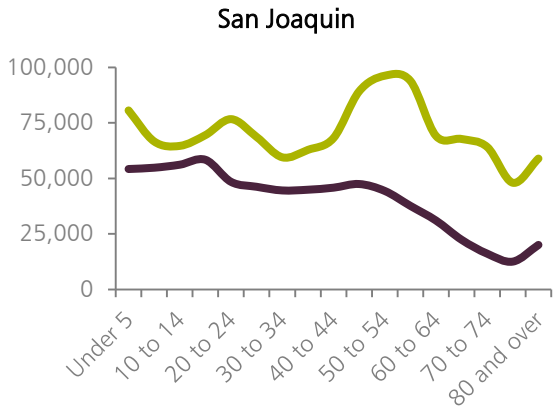
Figure 10 shows the age distribution across the Valley as of the 2010 Census and the age distribution forecast for 2050. The age bump in the 15 to 19 cohort in 2010 would become, with migration, the very large bulge in the 50 to 54 cohort in 2050. As this and the adjacent cohorts age over time, they would have profound impacts on housing, public services, and the economy, similar to the effects nationally of the baby boom generation. Figure 11 shows the age distribution for the eight counties in 2010 and 2050.

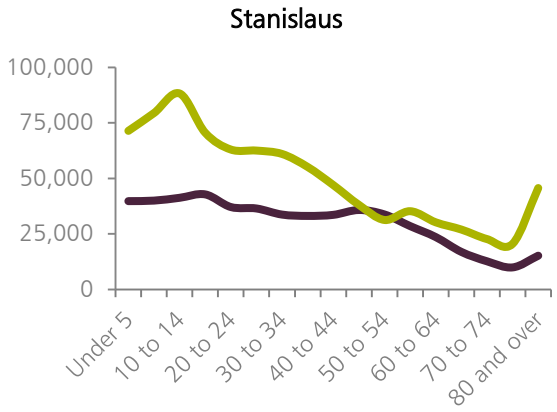
Figure 10: Age Distribution, San Joaquin Valley, 2010 and 2050

Source: The Planning Center|DC&E, 2012; data for 2010 are from the US Census Bureau.

Figure 11: Age Distribution, Eight San Joaquin Valley Counties, 2010 and 2050







The charts for the individual counties show that three of the counties have the pronounced bump in the 50 to 54 age cohort in 2050: Kern, Merced, and San Joaquin. Fresno, Madera and Tulare counties have a slight bump, but it does not overshadow the rest of the age distribution. Finally, Kings and Stanislaus counties have age distributions that show no signs of the population bump in the 50 to 54 age cohort.

The cohort component models for the individual counties use the same statewide data for survival rates to calculate mortality. The fertility rates and the number of women in child-bearing age cohorts are unique to each county, but they are not too dissimilar. The primary difference among the individual models is the assumed migration rate by age cohort. Thus most of the differences in the long-range forecasts is driven by migration. These forecasts implicitly assume that migration rates will continue. To the degree that migration patterns change, the age distributions could change, perhaps significantly.

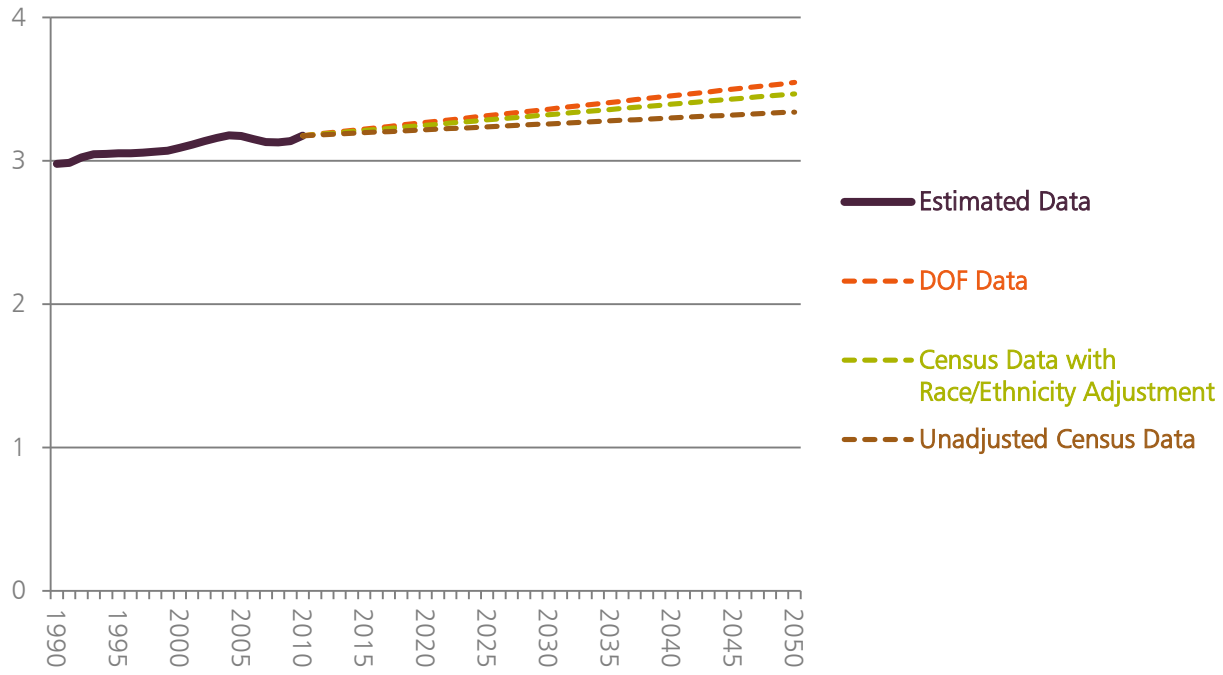
Average Household Size

The forecast model for average household size evaluated three different projections. The first used a least squares line fitted to the DOF-estimated average household size from 1990 to 2010. The second used the average household size from the 1990, 2000, and 2010 Censuses, and the average household size by units in structure from the 1990 and 2000 Censuses and the 2010 American Community Survey. The third model used average household size by race and ethnicity data from the 2000 and 2010 Censuses. Figure 12 shows the three projections for average household size.

All three projections showed an increasing average household size. This result seems suspect in light of the long-term national decline in average household size, as described in the Introduction. On the other hand, international migration, especially from Central and South America and from Asia tends to increase household size. And the increasing rate of multigenerational family households will also lead to larger households. Because these larger trends are likely to continue in the San Joaquin Valley, no adjustment has been made to adjust the average household size downward to approach the national trend of decreasing household size.

The model based on DOF data projects the largest household sizes (3.55 Valley-wide in 2050) and the model based on Census data unadjusted for race and ethnicity projects the smallest increase in household size (3.34 Valley-wide in 2050). The forecast uses the middle projection produced using Census data with the adjustment for race and ethnicity.

Figure 12: Comparison of Three Projections for Average Household Size, San Joaquin Valley, 1990 to 2050



Source: The Planning Center|DC&E, 2012; estimated data are COF estimates for average household size.

Table 11 summarizes the forecast change in average household size from 2010 to 2050 for each of the eight counties. The current average household size ranges from a low of 3.08 in Stanislaus to a high of 3.36 in Tulare. By 2050, Stanislaus would still have the lowest average household size, but Kings County would have the highest, at 3.77. The average household size Valley-wide would increase from 3.17 to 3.47.

Table 11: Forecast for Average Household Size, Eight San Joaquin Valley Counties, 2010 and 2050

	Fresno	Kern	Kings	Madera	Merced	San Joaquin	Stanislaus	Tulare	San Joaquin Valley
2010	3.15	3.15	3.19	3.28	3.32	3.12	3.08	3.36	3.17
2050	3.27	3.34	3.77	3.54	3.43	3.22	3.15	3.44	3.47
Increase:	0.31	0.40	0.92	0.45	0.17	0.19	0.20	0.24	0.30

Source: The Planning Center|DC&E, 2012.

Household Income

The household income forecast covers two distinct demographic characteristics, the distribution of households among nine income groups and the median household income. The model converts the nine income categories under which data is currently reported by the Census Bureau into the five categories required for the traffic model, and adjusts the forecasts to account for differing income distributions and differing population growth rates among race and ethnic classifications.

For the distribution of households across income categories, the data are not adjusted for inflation. The categories remain the same, and over time, one

should expect inflationary effects to gradually move households into higher income categories.

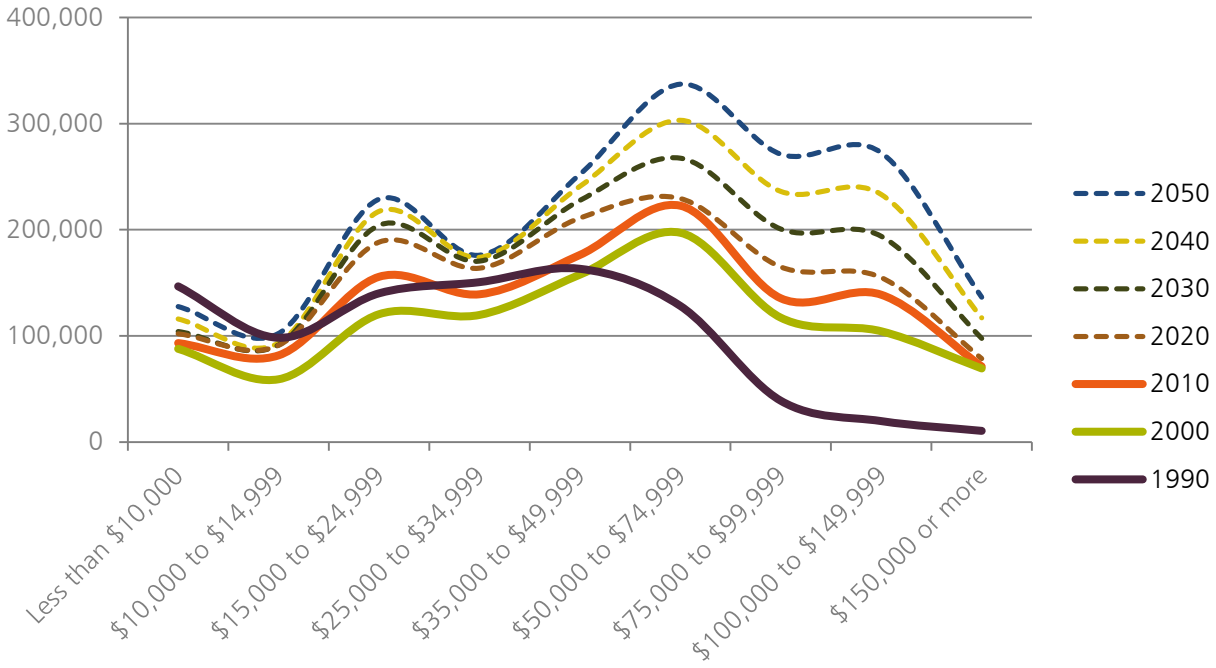
The model does not account for differing income distributions among age categories. Nevertheless, each county's past migration patterns—that is the relative ages of those moving into and out of each county—will have influenced the trend. Projecting the trend forward implicitly assumes that those migration patterns will continue.

Valley-wide Income Distribution Forecast

Figure 13 graphically shows the distribution of households by income categories. In 1990, 78% of households had annual income of $50,000 or less. Ten years later, the total number of households in every income category below $50,000 per year had decreased, and the number in every category from $50,000 and above had increased. By 2010, there more households in every category, but the distribution changed very little. If present trends continue, the number of households would increase in each income category, with the highest rates of growth in the categories from $75,000 and above. Table 12 summarizes the Valley-wide income distribution forecast.

Because income distribution data is not adjusted for inflation, Figure 13 conveys an image that is far rosier than reality. As a point of reference, a $100,000 per year household income in 2005 had the same purchasing power as a $20,000 household income in 1965. Thus, the large increases in the upper income categories do not necessarily imply an increase in purchasing power or living standard.

Figure 13: Distribution of Households by Income Category, San Joaquin Valley, 1990 to 2050



Source: The Planning Center|DC&E, 2012, with data from the 1990 Census, 2000 Census, and 2010 ACS.

Table 12: Summary of Household Distribution by Income by Category Forecast, San Joaquin Valley, 2010 to 2050

	Less than $10,000	$10,000–$14,999	$15,000–$24,999	$25,000–$34,999	$35,000–$49,999	$50,000–$74,999	$75,000–$99,999	$100,000–$149,999	$150,000 or more
2010	93,278	81,722	155,691	139,227	176,290	222,632	135,440	138,804	71,249
2050	127,660	102,374	228,752	176,034	252,222	337,116	271,106	272,488	136,492
Increase:	34,382	20,652	73,061	36,807	75,932	114,484	135,666	133,684	65,243
Annual Rate of Change:	0.8%	0.6%	1.0%	0.6%	0.9%	1.0%	1.8%	1.7%	1.6%

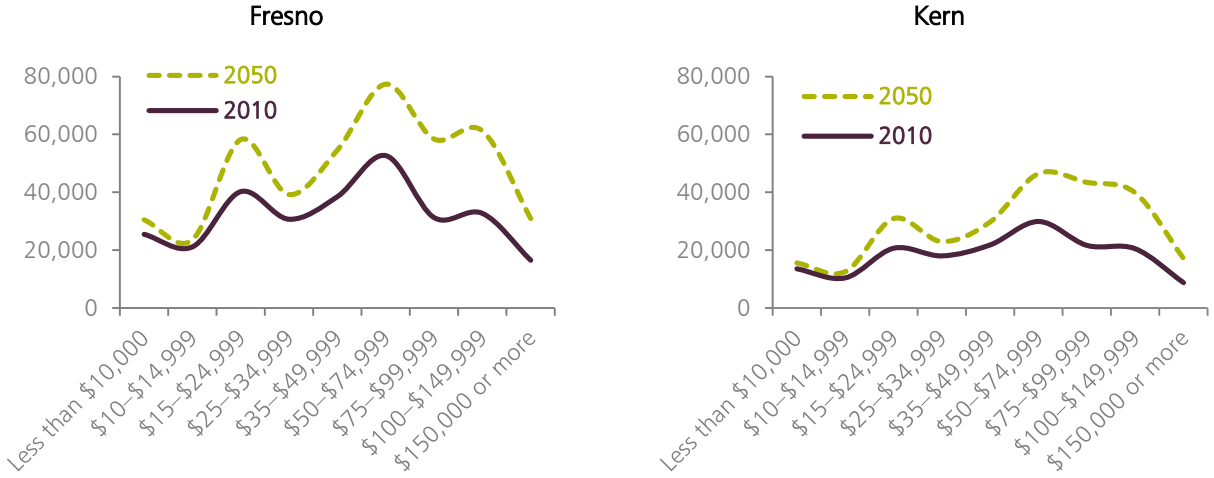
Source: The Planning Center|DC&E, 2012.

Eight Counties Income Distribution Forecast

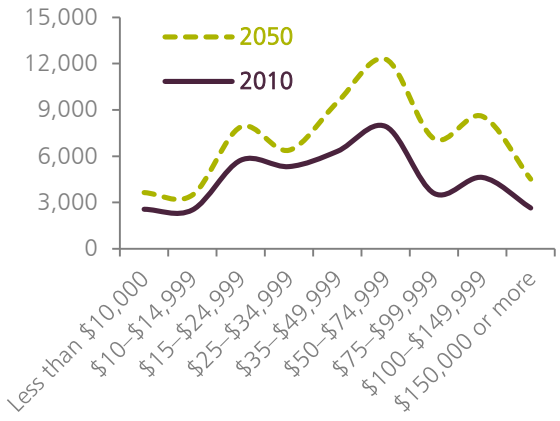
Figure 14 graphically shows the household distribution by income category for each of the eight counties in 2010 and 2050. Table 13 summarizes the forecasts.

As discussed in the Valley-wide forecast, these charts appear to suggest large increases in household income because the data are not adjusted for inflation. The median household income forecast provides a much better understanding of the real increase in household income and purchasing power because the median household income data can be adjusted for inflation.

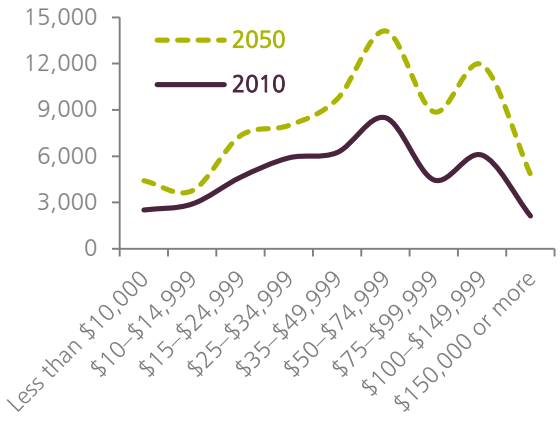
Figure 14: Household Distribution by Income Category, Eight San Joaquin Counties, 2010 and 2050



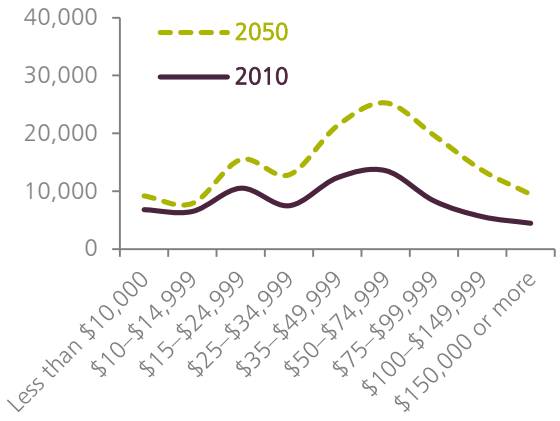
Kings



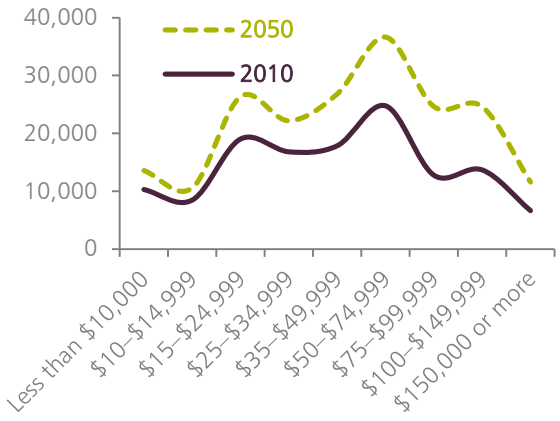
Madera



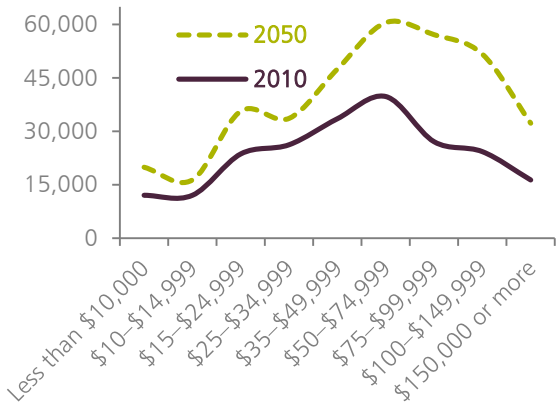
Merced



Tulare



San Joaquin



Stanislaus

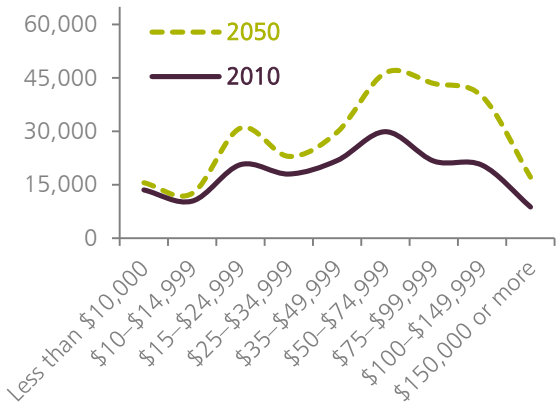


Table 13: Household Distribution by Income Category Forecast, Eight San Joaquin Valley Counties, 2010 to 2050

	Less than $10,000	$10,000–$14,999	$15,000–$24,999	$25,000–$34,999	$35,000–$49,999	$50,000–$74,999	$75,000–$99,999	$100,000–$149,999	$150,000 or more
Fresno County									
2010	25,466	21,126	40,225	30,675	38,489	52,669	31,254	32,701	16,495
2050	30,480	23,587	58,236	39,207	54,605	77,394	58,410	61,225	30,938
Increase	5,014	2,461	18,011	8,532	16,116	24,725	27,156	28,524	14,443
Annual Rate	0.5%	0.3%	0.9%	0.6%	0.9%	1.0%	1.6%	1.6%	1.6%
Kern County									
2010	20,114	17,823	31,317	28,771	39,719	45,575	26,225	31,317	13,749
2050	26,309	22,025	47,291	36,789	54,504	65,638	54,021	61,647	26,559
Increase	6,195	4,202	15,974	8,018	14,785	20,063	27,796	30,330	12,810
Annual Rate	0.7%	0.5%	1.0%	0.6%	0.8%	0.9%	1.8%	1.7%	1.7%
Kings County									
2010	2,559	2,518	5,737	5,324	6,315	7,925	3,591	4,623	2,642
2050	3,640	3,483	7,896	6,387	9,497	12,285	7,133	8,582	4,512
Increase	1,081	965	2,159	1,063	3,182	4,360	3,542	3,959	1,870
Annual Rate	0.9%	0.8%	0.8%	0.5%	1.0%	1.1%	1.7%	1.6%	1.3%
Madera County									
2010	2,512	2,902	4,635	5,891	6,238	8,490	4,462	6,064	2,123
2050	4,410	3,761	7,330	7,991	9,700	14,117	8,876	11,921	4,817
Increase	1,898	859	2,695	2,100	3,462	5,627	4,414	5,857	2,694
Annual Rate	1.4%	0.7%	1.2%	0.8%	1.1%	1.3%	1.7%	1.7%	2.1%
Merced County									
2010	6,815	6,512	10,525	7,496	12,342	13,553	8,329	5,603	4,467
2050	9,191	7,903	15,474	12,839	21,330	25,272	19,656	13,608	9,456
Increase	2,376	1,391	4,949	5,343	8,988	11,719	11,327	8,005	4,989
Annual Rate	0.8%	0.5%	1.0%	1.4%	1.4%	1.6%	2.2%	2.2%	1.9%
San Joaquin County									
2010	12,040	12,040	23,651	26,231	33,541	39,776	27,091	24,296	16,341
2050	19,915	16,358	35,681	33,637	47,498	60,540	57,153	51,683	32,287
Increase	7,875	4,318	12,030	7,406	13,957	20,764	30,062	27,387	15,946
Annual Rate	1.3%	0.8%	1.0%	0.6%	0.9%	1.1%	1.9%	1.9%	1.7%
Stanislaus County									
2010	13,545	10,406	20,648	18,005	21,804	29,898	21,639	20,482	8,755
2050	15,566	12,565	30,912	22,962	29,761	46,460	43,437	39,823	17,129
Increase	2,021	2,159	10,265	4,957	7,957	16,562	21,798	19,341	8,374
Annual Rate	0.3%	0.5%	1.0%	0.6%	0.8%	1.1%	1.8%	1.7%	1.7%
Tulare County									
2010	10,298	8,473	19,031	16,815	17,858	24,767	12,774	13,687	6,648
2050	13,579	10,579	26,361	22,189	26,814	36,646	24,642	24,607	11,588
Increase	3,281	2,106	7,330	5,374	8,956	11,879	11,868	10,920	4,940
Annual Rate	0.7%	0.6%	0.8%	0.7%	1.0%	1.0%	1.7%	1.5%	1.4%

Source: The Planning Center|DC&E, 2012.

Eight Counties Median Household Income Forecast

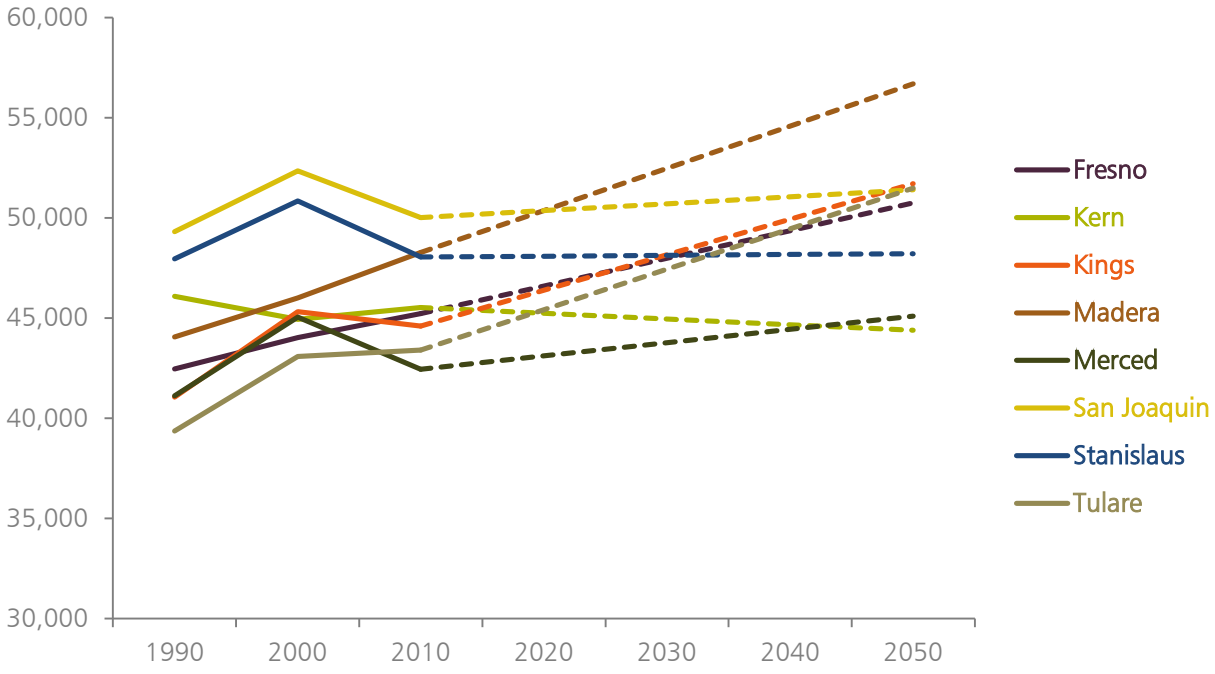
The forecast model adjusts the median household income data from 1990, 2000, and 2010 for inflation and then fits the least-squares line to the adjusted data. Projecting that line forward provides the forecast for real median household income. Increases in the real income signify increases in purchasing power and the potential for an improved standard of living.

Figure 15 graphically shows the real median household forecasts for the eight counties. Table 14 summarizes the forecast for each of the counties.

If present trends continue, Kings, Madera, and Tulare counties would experience the largest increase in real household income. Even in these counties, however, the increase would only be 0.4% per year, and the median household would see only a $7,000 to $8,000 increase in real terms over 40 years. Fresno, Merced, and San Joaquin counties would have slightly less growth in household income; Stanislaus would have almost no change; and Kern County would see a decline in real household income.

These forecasts have implications for a full spectrum of public policies. In regard to land use planning, however, the lack of substantial growth in real household income suggests that the region will not be able to support increases in housing costs above the rate of inflation. Furthermore, it suggests that households will be unable to increase retail spending beyond the rate of inflation. With little increase in retail spending and property values beyond the rate of inflation, local government revenues are unlikely to increase on a per capita and inflation-adjusted basis.

Figure 15: Real Median Household Income Forecast, Eight San Joaquin Valley Counties 1990 to 2050



Source: The Planning Center|DC&E, 2012, using data from the US Census Bureau.

Table 14: Summary of Real Median Household Income Forecast, Eight San Joaquin Valley Counties, 2010 to 2050

	Fresno	Kern	Kings	Madera	Merced	San Joaquin	Stanislaus	Tulare
2010	45,221	45,524	44,609	48,268	42,449	50,011	48,044	43,397
2050	50,744	44,387	51,709	56,688	45,097	51,406	48,216	51,476
Increase	5,523	-1,137	7,100	8,420	2,648	1,395	172	8,079
Annual Rate of Change	0.3%	-0.1%	0.4%	0.4%	0.2%	0.1%	0.0%	0.4%

Source: The Planning Center|DC&E, 2012, using data from the US Census Bureau.

Household Type

The household type model uses data from the 1990, 2000, and 2010 Censuses to forecast the number of household in four categories: Family households with children under age 18; Family households without children under age 18; Single person households; All other non-family households.

Valley-wide Forecast

Figure 16 shows the trend and forecast for household by type of for the Valley, and Table 15 summarizes the forecast.

If present trends continue, family households with children under the age of 18 would increase at the slowest rate among the four household types. By 2045, the number of family households without children under age 18 would exceed the number with children. Non-family households would account for over 25% of the total household growth. Even still, families with and without children would grow faster than non-family households.

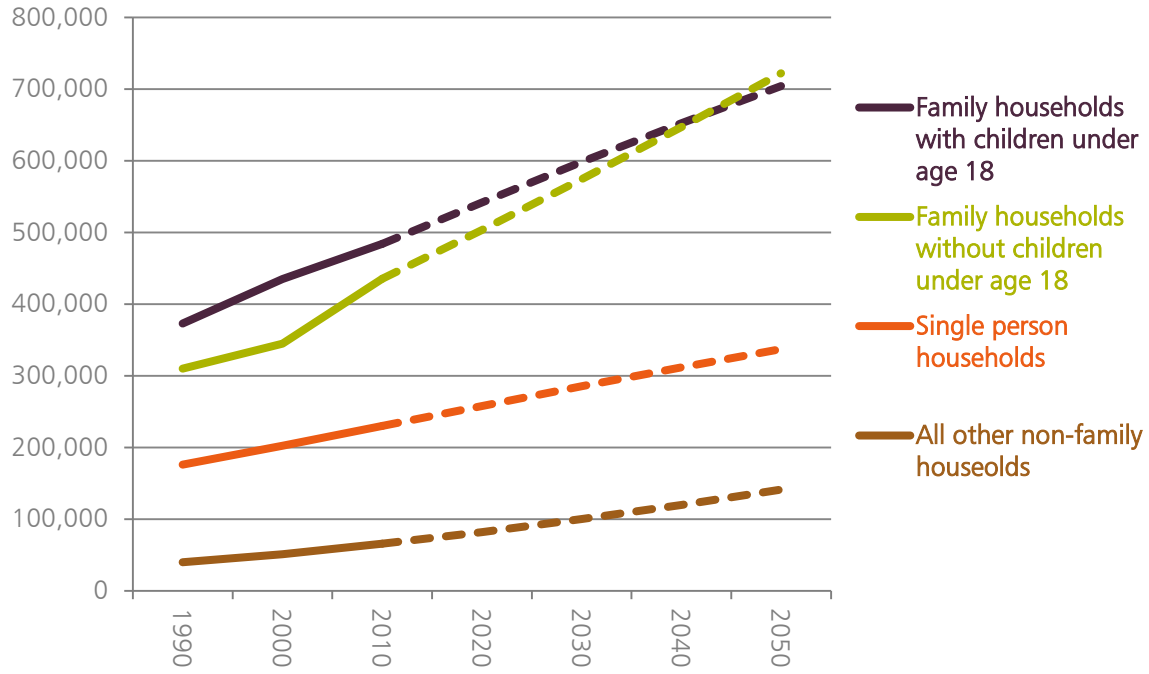
This forecast is consistent with the age distribution forecast, which shows a population bulge in the 50 to 59 age cohort in 2050 and is consistent with the forecast for increasing household size.

Table 15: Summary of Household Type Forecast, San Joaquin Valley, 2010 to 2050

	Family households with children under age 18	Family households without children under age 18	Single person households	All other non-family households
2010	483,811	435,117	230,026	65,778
2050	704,141	721,847	336,949	141,306
Change	220,330	286,730	106,923	75,528
Annual Rate of Change	0.9%	1.3%	1.0%	1.9%
Share of Total Change	32.0%	41.6%	15.5%	11.0%

Source: The Planning Center|DC&E, 2012, using data from the US Census Bureau.

Figure 16: Household Type Forecast, San Joaquin Valley, 1990 to 2050



Source: The Planning Center|DC&E, 2012, using data from the US Census Bureau.

Eight Counties Forecast

Table 16 summarizes the forecast for household type for each of the eight counties. As with the Valley-wide forecast, families without children under the age of 18 would add more households and grow at a faster rate than families with children. By 2050, families without children would outnumber families with children in Fresno, Madera, Merced, San Joaquin, Stanislaus, and Tulare counties. In all eight counties, non-family households would grow a faster rate than the other three household types. However, families with and without children would still account for the majority of all households.

Table 16: Summary of Household Type Forecast, Eight San Joaquin Valley Counties, 2010 to 2050

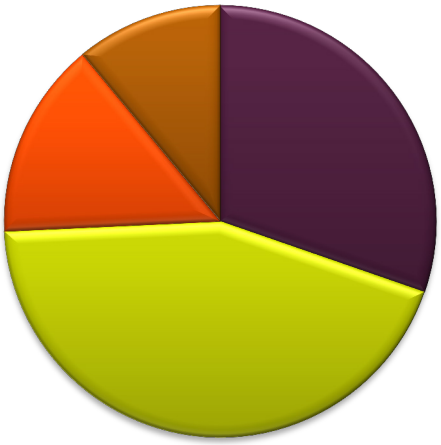
	Family households with children under age 18	Family households without children under age 18	Single person households	All other non-family households
Fresno County				
2010	111,984	102,165	57,233	17,610
2050	155,939	165,957	78,672	33,514
Increase	43,955	63,792	21,439	15,904
Annual Rate of Change	0.8%	1.2%	0.8%	1.6%
Share of Total Increase	30.3%	44.0%	14.8%	11.0%
Kern County				
2010	102,961	88,778	49,209	13,662
2050	152,703	140,999	71,475	29,606
Increase	49,742	52,221	22,266	15,944
Annual Rate of Change	1.0%	1.2%	0.9%	2.0%
Share of Total Increase	35.5%	37.3%	15.9%	11.4%

	Family households with children under age 18	Family households without children under age 18	Single person households	All other non-family households
Kings County				
2010	17,793	14,146	7,197	2,097
2050	24,116	22,647	11,000	5,650
Increase	6,323	8,501	3,803	3,553
Annual Rate of Change	0.8%	1.2%	1.1%	2.5%
Share of Total Increase	28.5%	38.3%	17.1%	16.0%
Madera County				
2010	16,220	17,873	7,251	1,973
2050	21,333	32,690	13,322	5,579
Increase	5,113	14,817	6,071	3,606
Annual Rate of Change	0.7%	1.5%	1.5%	2.6%
Share of Total Increase	17.3%	50.0%	20.5%	12.2%
Merced County				
2010	32,134	26,633	13,157	3,718
2050	48,848	52,410	23,698	9,775
Increase	16,714	25,777	10,541	6,057
Annual Rate of Change	1.1%	1.7%	1.5%	2.4%
Share of Total Increase	28.3%	43.6%	17.8%	10.3%
San Joaquin County				
2010	83,711	77,346	42,389	11,561
2050	136,117	131,181	63,668	23,787
Increase	52,406	53,835	21,279	12,226
Annual Rate of Change	1.2%	1.3%	1.0%	1.8%
Share of Total Increase	37.5%	38.5%	15.2%	8.7%
Stanislas County				
2010	62,458	61,574	31,923	9,225
2050	84,651	106,049	47,878	20,037
Increase	22,193	44,475	15,955	10,812
Annual Rate of Change	0.8%	1.4%	1.0%	2.0%
Share of Total Increase	23.8%	47.6%	17.1%	11.6%
Tulare County				
2010	56,395	46,461	21,588	5,908
2050	81,634	71,914	29,337	14,121
Increase	25,239	25,453	7,749	8,213
Annual Rate of Change	0.9%	1.1%	0.8%	2.2%
Share of Total Increase	37.9%	38.2%	11.6%	12.3%

Source: The Planning Center|DC&E, 2012, using data from the US Census Bureau.

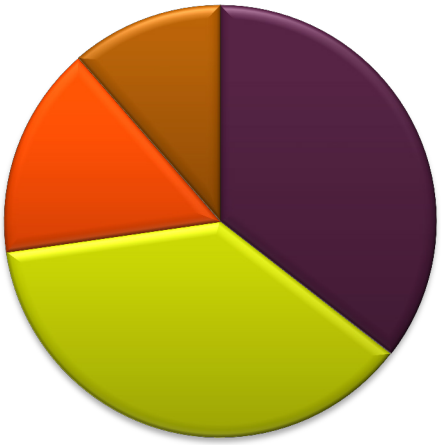
Figure 17: Household Growth by Household Type (annual growth rate and total increase), Eight San Joaquin Valley Counties, 2010 to 2050

Fresno



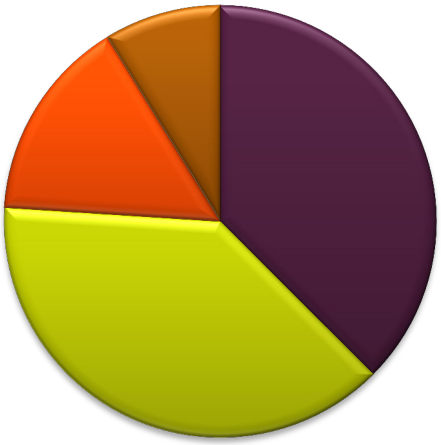
- Family households with children under age 18 (0.83% 43,955)
- Family households without children under age 18 (1.22% 63,792)
- Single person households (0.80% 21,439)
- All other non-family houseolds (1.62% 15,904)

Kern



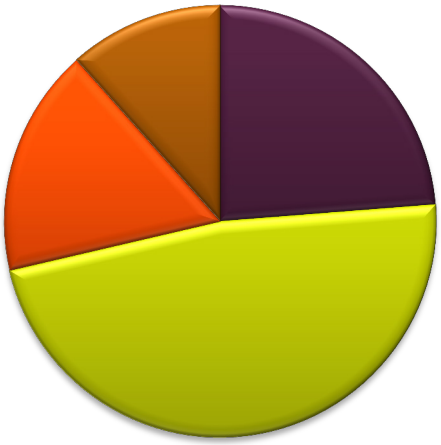
- Family households with children under age 18 (0.99% 49,742)
- Family households without children under age 18 (1.16% 52,221)
- Single person households (0.94% 22,266)
- All other non-family houseolds (1.95% 15,944)

San Joaquin



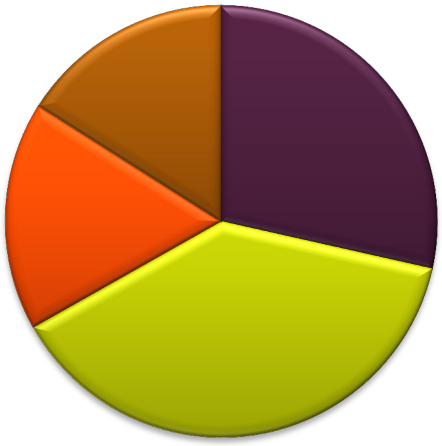
- Family households with children under age 18 (1.22% 52,406)
- Family households without children under age 18 (1.33% 53,835)
- Single person households (1.02% 21,279)
- All other non-family houseolds (1.82% 12,226)

Stanislaus



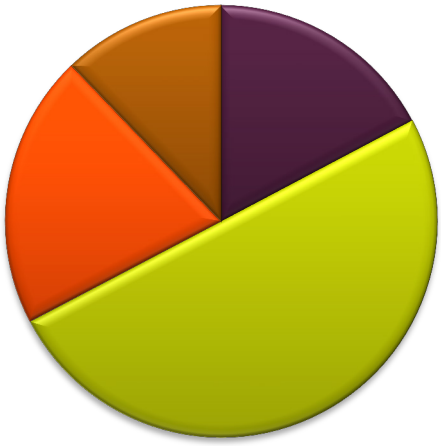
- Family households with children under age 18 (0.76% 22,193)
- Family households without children under age 18 (1.37% 44,475)
- Single person households (1.02% 15,955)
- All other non-family houseolds (1.96% 10,812)

Kings



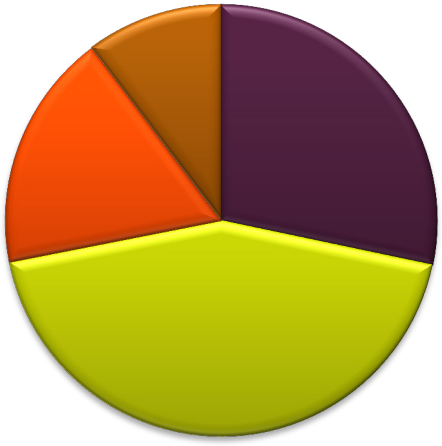
- Family households with children under age 18 (0.76% 6,323)
- Family households without children under age 18 (1.18% 8,501)
- Single person households (1.07% 3,803)
- All other non-family houseolds (2.51% 3,553)

Madera



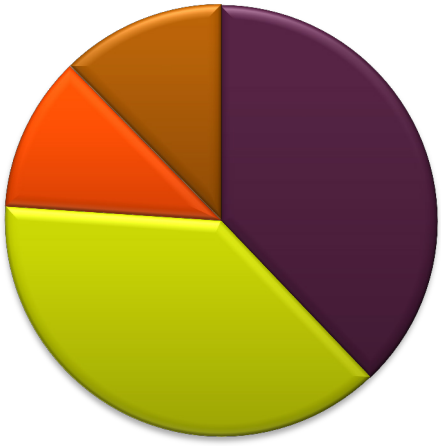
- Family households with children under age 18 (0.69% 5,113)
- Family households without children under age 18 (1.52% 14,817)
- Single person households (1.53% 6,071)
- All other non-family houseolds (2.63% 3,606)

Merced



- Family households with children under age 18 (1.05% 16,714)
- Family households without children under age 18 (1.71% 25,777)
- Single person households (1.48% 10,541)
- All other non-family houseolds (2.45% 6,057)

Tulare



- Family households with children under age 18 (0.93% 25,239)
- Family households without children under age 18 (1.10% 25,453)
- Single person households (0.77% 7,749)
- All other non-family houseolds (2.20% 8,213)

Race and Ethnicity

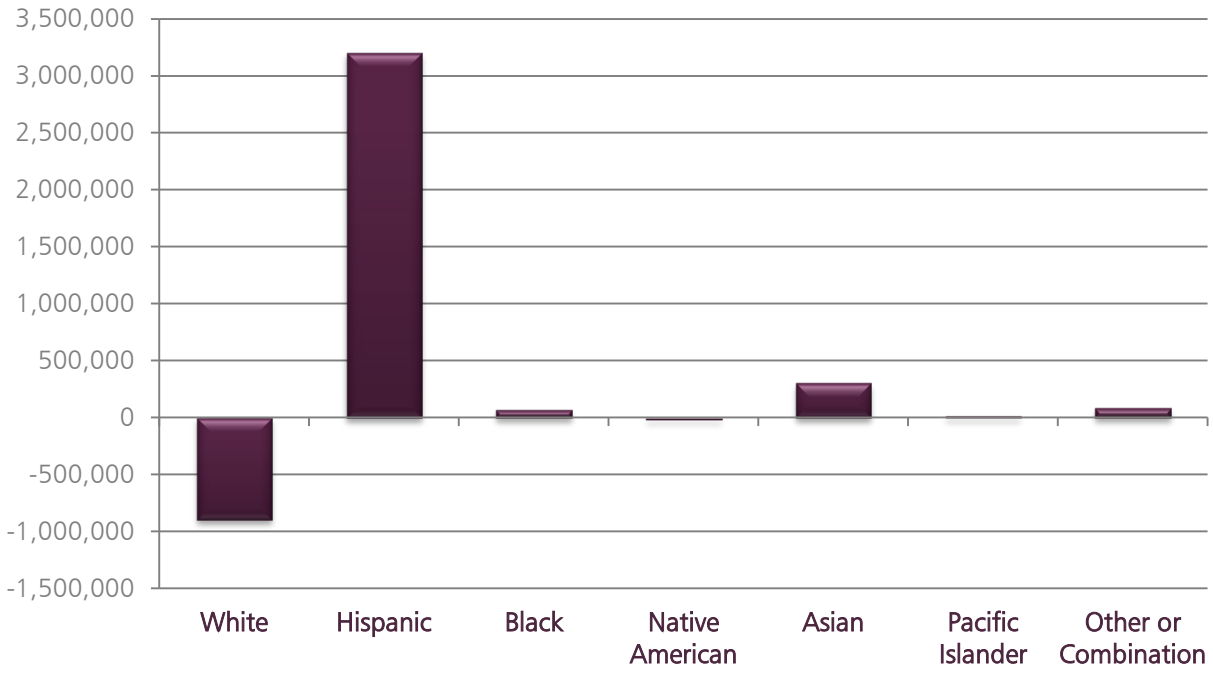
The San Joaquin Valley, like many parts of California, has experienced substantial immigration, especially Hispanics, and Asians to a lesser degree. Other forecasts have made adjustments to reflect differences in demographics characteristics among race and ethnic groups. The final model forecasts changes in the racial and ethnic composition of the population.

Valley-wide Forecast

Figure 18 graphically shows the change in the population by race and ethnicity, and Table 17 summarizes the forecast.

If present trends continue, the white non-Hispanic population in the Central Valley will continue to decline in total number. The magnitude of the decline, 2.4% per year, is too large to represent just natural change (births and deaths). This indicates an out-migration of this population. Similarly, the total number of Hispanics would continue to increase, and the magnitude of this change, 2.6% per year, is too large to represent natural increase. This suggests that the Central Valley would continue to attract Hispanic in-migration, whether domestic or international. Asians would constitute a large source of population growth, although the rate of growth in this group, 1.8% per year, would be lower than that of Native Hawaiian and Pacific Islander.

Figure 18: Change in Population by Race and Ethnic Group, San Joaquin Valley, 2010 to 2050



Source: The Planning Center|DC&E, 2012, using data from the US Census Bureau.

Table 17: Summary of Forecast of Population by Race and Ethnicity, San Joaquin Valley, 2010 to 2050

	White alone, non-Hispanic	Hispanic, all races	Black or African American alone, non-Hispanic	American Indian and Alaska Native alone, non-Hispanic	Asian alone, non-Hispanic	Native Hawaiian and Other Pacific Islander alone, non-Hispanic	Some other race alone or in combination, non-Hispanic
2010	1,451,451	1,820,337	181,592	25,457	279,474	9,506	203,842
2050	559,461	5,024,454	251,976	11,697	581,563	26,474	284,374
Increase	-891,990	3,204,117	70,384	-13,760	302,089	16,968	80,532
Annual Rate of Change	-2.4%	2.6%	0.8%	-1.9%	1.8%	2.6%	0.8%

Source: The Planning Center|DC&E, 2012, using data from the US Census Bureau.

Eight County Forecasts

The forecasts for the eight counties indicate that all would follow a similar pattern as the Valley as a whole: a sizeable out-migration of the white non-Hispanic population and an even large increase in the Hispanic population. The four largest counties, Fresno, Kern, San Joaquin, and Stanislaus would also have a significant increase in the Asian population. Table 18 summarizes the forecast for each county.

Table 18: Summary of Race and Ethnicity Forecast, Eight San Joaquin Valley Counties, 2010 to 2050

	White alone, non-Hispanic	Hispanic, all races	Black or African American alone, non-Hispanic	American Indian and Alaska Native alone, non-Hispanic	Asian alone, non-Hispanic	Native Hawaiian and Other Pacific Islander alone, non-Hispanic	Some other race alone or in combination, non-Hispanic
Fresno County							
2010	304,522	442,992	45,005	5,979	86,856	1,066	44,030
2050	159,100	1,004,444	65,630	3,195	220,155	3,283	65,193
Increase	-145,422	561,452	20,625	-2,784	133,299	2,217	21,163
Annual Rate	-1.6%	2.1%	0.9%	-1.6%	2.4%	2.9%	1.0%
Kern County							
2010	323,794	391,144	45,377	5,893	33,100	995	39,328
2050	227,959	1,027,764	81,180	4,578	98,741	2,406	97,373
Increase	-95,835	636,620	35,803	-1,315	65,641	1,411	58,045
Annual Rate	-0.9%	2.4%	1.5%	-0.6%	2.8%	2.2%	2.3%
Kings County							
2010	53,879	73,630	10,314	1,297	5,339	228	8,295
2050	43,109	182,126	7,517	984	13,461	409	18,393
Increase	-10,770	108,496	-2,797	-313	8,122	181	10,098
Annual Rate	-0.6%	2.3%	-0.8%	-0.7%	2.3%	1.5%	2.0%
Madera County							
2010	57,380	77,097	5,009	1,790	2,533	107	6,949
2050	47,386	217,480	6,121	2,116	9,062	0	7,097
Increase	-9,994	140,383	1,112	326	6,529	-107	148
Annual Rate	-0.5%	2.6%	0.5%	0.4%	3.2%	-100.0%	0.1%
Merced County							
2010	81,599	133,256	8,785	1,126	18,183	476	12,368
2050	40,399	350,943	14,883	987	41,706	1,655	10,428
Increase	-41,200	217,687	6,098	-139	23,523	1,179	-1,940
Annual Rate	-1.7%	2.5%	1.3%	-0.3%	2.1%	3.2%	-0.4%
San Joaquin County							
2010	245,919	244,695	48,540	3,179	94,547	3,248	45,178
2050	62,612	620,688	119,744	294	286,834	13,162	100,667
Increase	-183,307	375,993	71,204	-2,885	192,287	9,914	55,489
Annual Rate	-3.4%	2.4%	2.3%	-5.8%	2.8%	3.6%	2.0%
Stanislaus County							
2010	240,423	201,738	13,065	2,870	24,712	3,016	28,629
2050	100,686	592,986	28,360	0	66,547	14,183	48,007
Increase	-139,737	391,248	15,295	-2,870	41,835	11,167	19,378
Annual Rate	-2.2%	2.7%	2.0%	-100.0%	2.5%	3.9%	1.3%
Tulare County							
2010	143,935	255,785	5,497	3,323	14,204	370	19,065
2050	48,410	597,911	6,419	4,396	27,330	962	24,572
Increase	-95,525	342,126	922	1,073	13,126	592	5,507
Annual Rate	-2.7%	2.1%	0.4%	0.7%	1.6%	2.4%	0.6%

Source: The Planning Center|DC&E, 2012, using data from the US Census Bureau.

Appendix

The appendix provides definitions of terminology used in the report, followed by tables providing the data and analysis referenced in the report.

Terminology

Household

The Census Bureau defines a household as all the people who occupy a single housing unit. A household includes the related family members and all the unrelated people, if any, such as lodgers, foster children, wards, or employees who share the housing unit. A person living alone in a housing unit, or a group of unrelated people sharing a housing unit such as partners or roomers, is also counted as a household. The count of households excludes group quarters. There are two major categories of households, "family" and "nonfamily".

Family Household

The Census Bureau defines a family as a group of two people or more (one of whom is the householder) related by birth, marriage, or adoption and residing together; all such people (including related subfamily members) are considered as members of one family. A family household is defined as a household maintained by a householder who is in a family (as defined above), and includes any unrelated people (unrelated subfamily members and/or secondary individuals) who may be residing there. The number of family households is equal to the number of families. The count of family household members differs from the count of family members, however, in that the family household members include all people living in the household, whereas family members include only the householder and his/her relatives.

Nonfamily Household

The Census Bureau defines a nonfamily household as householder living alone (a one-person household) or where the householder shares the home exclusively with people to whom he/she is not related.

Housing Unit

The Census Bureau defines a housing unit as a house, an apartment or other group of rooms, or a single room, when it is occupied or intended for occupancy as separate living quarters; that is, when the occupants do not live and eat with any other persons in the structure and there is direct access from the outside or through a common hall.

Projection and Forecast

Although these two terms are often used interchangeably, there is a difference between the two. A projection most often refers to the extension of a particular trend into the future. For a particular demographic characteristic, there might be several datasets and several trends that describe or influence the characteristic. Thus there could be several projections for the characteristic, and these projections may vary greatly. On the other hand, there is usually a single forecast. The forecast represents an analysis of different projections, application of assumptions, and the professional judgment of the demographer or statistician preparing the forecast.